Disaster Nursing or Nursing in Disaster: A Case Study Approach to Investigate the Future Requirements of Disaster Nursing in Norway

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Abstract

This PhD study has undertaken a critical evaluation of nurses' role in disasters and mass casualty events with particular reference to remote community settings. Nurses in particular are important in order to reduce the effect of a disaster on the affected population and growing awareness of disaster facilitates and opens up discussion in relation to 'disaster nursing'. Disaster Nursing (DN) can be briefly defined as providing holistic nursing to affected populations in all phases of a disaster. The main aim has been *to critically evaluate the present and future requirements of Disaster Nursing using rural northern Norway as a case study.*

Rural northern Norway was chosen as a case study because the country as a whole represents an industrially advanced society with comparatively sophisticated health care provision and developed municipal nursing services. A Disaster Nursing (DN) and more generalist Nursing in Disaster (ND) Conceptual Framework (DN-ND) was introduced to understand the routes and processes for developing (more) effective disaster nursing arrangements and education.

Interviews of municipal nurses and their leaders working in different districts of rural northern Norway revealed that nurses had little or no influence on or knowledge of local Disaster Management and Health Preparedness plans. The opinions of nurses and leaders also exposed that disaster training and exercises did not involve nurses. However, interviews uncovered the need for improvements in organisation, training and education of nurses to provide health care in disasters. Leaders and nurses express a need for Disaster topics at or in addition to BSc level, and a specialisation at MSc level, thus endorsing the DN-ND conceptual framework although with appropriate local adjustments.

Finally, it is demonstrated that only through university academic research in nursing, giving the provision of a permanent comprehensive educational and training strategy can nurses realistically manage to handle health care in relation to disasters for all the differing aspects of, and within the disaster management cycle.

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List of Abbreviations

A&E	Accident and Emergency
BSc	Bachelor of Science
CBRNE	Chemical, biological, radiation, nuclear, explosive
CPD	Continuous Professional Development
CRED	Centre for Research on the Epidemiology of Disasters
DN	Disaster Nurse also = Disaster Nursing in text
DRR	Disaster Risk Reduction
DSB	Norwegian Directorate for Civil Protection (Direktorat for Sikkerhet og Beredskap)
GDPC	Gross Domestic Product per Capita
Health-EDRM	Health Emergency and Disaster Risk Management
ICN	International Council of Nursing
IMF	International Monetary Fund
INKVTS	Norwegian Centre for Violence and Traumatic Stress Studies
LG2	Interview Group of Leaders
MSc	Master of Science
ND	Nursing in Disaster
NG1	Interview Group of Municipal Nurses
NSF	Norwegian Nurses' Organisation (Norsk Sykepleierforbund)
OECD	Organisation for Economic Co-operation and Development
PHC	Portable Health Clinics
PPE	Personal Protective Equipment
PTSD	Post-traumatic stress disorder
SAR	Search and Rescue
SFDRR	Sendai Framework for Disaster Risk Reduction
SIG	Special Interest Group
SWOT	Strengths, Weaknesses, Opportunities and Threats; strategic planning technique
UN	United Nations
UNISDR	United Nations Office for Disaster Risk Reduction
WADEM	World Association for Disaster and Emergency Medicine
WHO	World Health Organisation

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N=statistical sample size

ϵ=sampling error

σ=standard deviation – for homogenous sample σ =0.1

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Chapter 1

Introduction

1.0 Introduction

Healthcare resilience[1] is an integral part of disaster management and lies at the nexus between this and public health considerations (Pekarev et al. 2010, p.120; Miles 2016). As the largest group of health care professionals worldwide, nurses face continual challenges in further developing their competences in disaster response and recovery. This also seems particularly the case in the community nurse setting where nurses are often required to deal with multiple tasks and work independently. Since nurses are frequently the first health care professionals to respond in crises and are expected to also have knowledge in responding to disaster events, they need to be competent in their response (Alkhalaileh 2020). Furthermore, it is also increasingly recognized that disasters have become more frequent and often strike harder than before (Coppola 2015, pp.30-31) raising likelihoods for the nursing profession to be involved. Although no two disasters are exactly the same, nurses need to be able to improvise and adapt their practice as well as their professional knowledge of their work with affected people (Powers 2010, p.1). Moreover, given that nurses may acquire different experiences when handling various forms of disasters, this offers greater opportunities for continuous evaluation of nurses' experiences and lessons learned that can further improve the quality of care (Susanti et al. 2019; Menegat and Witt 2019; Xia et al. 2020; Hirohara et al. 2019).

There is also a pressing need to understand how community nurses handle disasters in different remote settings where nurses' experiences may be particularly challenging. This thesis investigates Norway as a case study since the country represents an industrially advanced society with comparatively sophisticated health care provision and developed community nursing services. The Gross Domestic Product per Capita (GDPC) has also had a robust growth in recent years and it is amongst the highest of the countries belonging to the Organisation for Economic Co-operation and Development (OECD). The most recent OECD report from 2019[2] demonstrates this and Norway is also expected

[1] Healthcare resilience definition: The capability to effectively absorb, respond to, and recover from an internally or externally induced set of extraordinary demands (Pekarev et al. 2010 p. 120)

[2] http://www.oecd.org/economy/norway-economic-snapshot/

by the OECD to have a good recovery from the COVID-19 crises[3]. The International Monetary Fund (IMF) in their report of November 2020[4] largely supports the conclusions by OECD with regards to the economic situation of Norway.

Furthermore, Norway is as shown above, a very affluent country and it is a member of United Nations (UN) and at present also a member of the UN security council. In terms of health care and nursing affiliations it is a member of the World Health Organisation (part of UN) and the International Council of Nursing (ICN). Through these memberships Norway develops and adheres to international norms in nursing. The country participates in and honours agreements seeking to enhance local, national, and international coordination on handling crises and disasters, such as the Sendai Framework for Disaster Risk Reduction (2015)[5]. In many ways then, Norway represents an illustrative case study for examining the challenges of disaster nursing especially in a country denoted by the existence of disparate rural regions where community health provision assumes notable significance. Moreover, at the same time, Norway is of analytical interest since it constitutes such a diverse and rather sparsely populated country with large rural regions, and faces notable challenges in building effective community resilience. Nurses serving these large and diverse rural communities should therefore be integrally involved in handling and preparing for possible disasters at the community level.

The northern part of Norway is sub-arctic, and that poses its own climatic challenges for nurses working there since mobility and provision of effective community services can be affected by the impact of changing weather conditions and low total hours of daylight in the winter season. Yet, it also important to highlight the diversity of the northern part of Norway too. Within northern Norway, there are three counties, namely Nordland, Troms and Finnmark. The latter two counties are situated north of the arctic circle; whilst Nordland county is divided with one part north and the other part south of the arctic circle (see Figure 1.1). This region of Norway (spanning the three counties) represents one third of the geographical area of Norway and thus distances between communities and key medical infrastructure like hospitals can be large.

In contrast, these counties are also denoted by low density of population, with for instance, the total population of all three counties together amounting to only 484 546

[3] https://www.oecd.org/coronavirus/en/
[4] https://www.imf.org/en/Publications/CR/Issues/2020/11/10/Norway-Financial-Sector-Assessment-Program-Technical-Note-Risk-Analysis-and-Stress-Testing-49873
[5] https://www.preventionweb.net/files/43291_sendaiframeworkfordrren.pdf

people; and represents 9% of all Norwegian inhabitants (Statistic Norway, 2020)[6]. This can be compared to Oslo, the capital, with 693 494 inhabitants or 12.76% of the total Norwegian population (Statistic Norway, 2020) living in one conurbation. Put another way, and as an illustrative comparison, the area of Finnmark county is larger than the whole of Denmark. Yet, total population is much smaller, with Finnmark, for example, having only 75 863 people living there; compared to Denmark that totals some 5 827 463 inhabitants (Statistic Norway, 2020).

Consequently, there are significant differences in the areas that are administrated by the various local governments in Norway. It is thus important as part of any study of disaster nursing to also take into account of the views of local governmental emergency planning and their perspectives towards disaster nursing since the challenges and hazards vary considerably when comparing very rural situations in sub-arctic Finnmark to the more urban areas near the capital city, Oslo. Dealing with disaster in these two disparate regions may require different approaches.

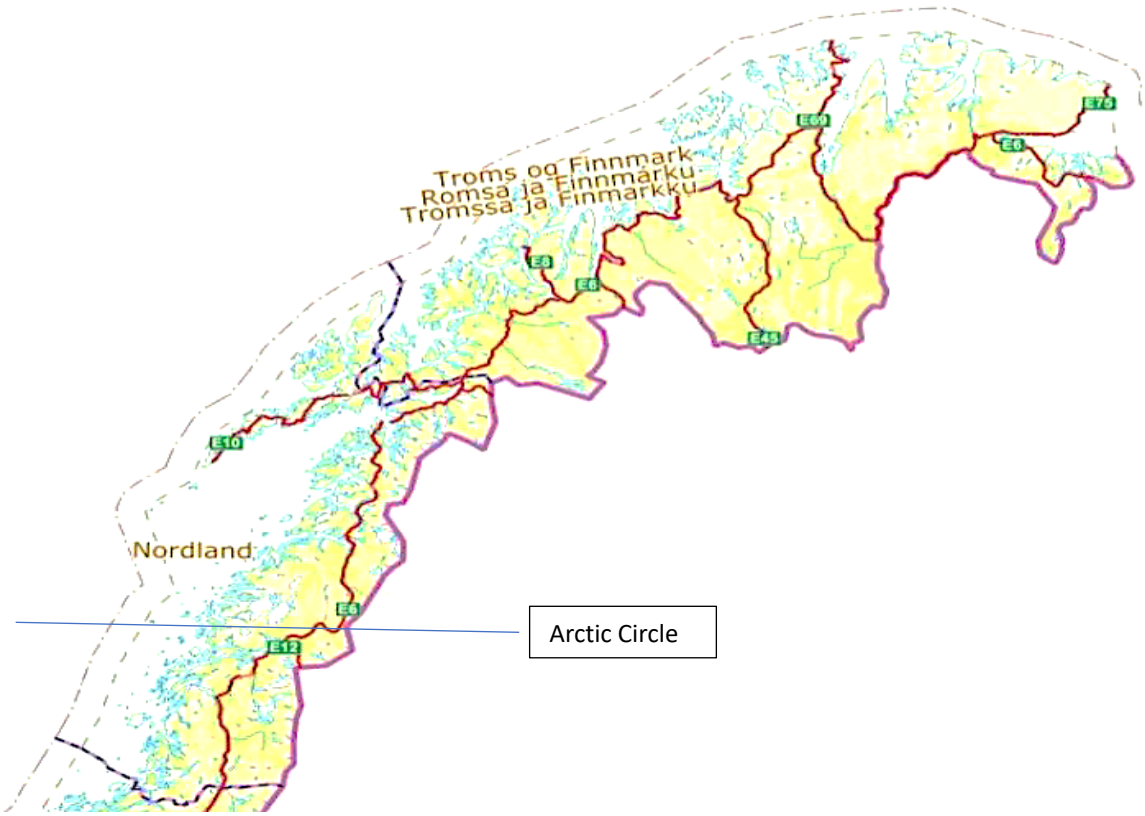


Figure 1.1 Map of the northern part of Norway – including county boundaries and major roads (red lines). country borders (purple lines) and county boundaries (blue and white lines) (Statistics Norway, 2020)

[6] Statistics Norway available at https://www.ssb.no

1.1 Disaster

Disasters have a huge impact on society and many of history´s great civilisations have been brought to their knees by the effect of natural disasters (Coppola 2015, pp. 3-4). For the purpose of this thesis a disaster is defined as:

"a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources" (UNISDR, 2009).

Moreover, since it is recognised that the complexity and numbers of disasters are increasing, this thesis adopts a wider 'all hazards' approach since nurses in remote community setting may be faced by a diversity of disasters. According to the Centre for Research on the Epidemiology of Disasters (CRED), for example, there were recorded 396 disasters triggered by natural hazards in 2019 with 95 million people affected and 11,755 deaths (CRED 2020)[7]. Natural disasters include earthquakes, tsunamis, volcanic eruptions, landslides, hurricanes, floods, wildfires, ice storms, extreme cold, heat waves and droughts (Coppola 2015, pp. 72-93).

One type of disaster in this category are pandemics that have significant impacts on society, people's lives and the health system that often becomes overwhelmed (Coppola 2015, p. 93). One example is the pandemic Covid 19 that has had an impact on the world in the present year (2020), and still is affecting all parts of the world.

Given that this thesis has been written in 2021 during the middle of this pandemic when full implications are unclear, the Covid 19 pandemic does not represent the primary focus of the present work. The more generic 'all hazards' focus of the thesis was developed and the research was carried out before the pandemic started. Indeed, it is often the case that natural disasters have an immediate impact on human lives and frequently have a longer-term impact on their society, people's health, well-being and survival (Coppola 2015, p. 20-28; Parker 2020). Modern public-health response mechanisms are also designed to handle post-disaster consequences covering a wide variety of hazards and disaster more effectively (Coppola 2015, p. 25; Handmer and Maynard 2021). This study assumes then that community nurses may be confronted by a diverse array of disaster related challenges.

[7] CRED Natural Disasters 2019. https://emdat.be/ sites/default/files/adsr_2019.pdf

Due to development in new technology, such as air transport and internet, society has become more vulnerable (Boin et al. 2010, pp. 5-6; Coppola 2015, pp.6- 42); for example, there is a rise in terrorism, emerging natural threats, and even threat of biological, chemical and nuclear terrorism (Boin et al. 2005, p.1). The result of increased urbanisation means that there is an increase in the number of people affected when a disaster strikes (Coppola 2015, p.20; UNISDR 2015). This implies that the challenges for nursing will also be quite diverse and needs to be encapsulated in the investigations of this thesis.

Figure 1.2 Disaster Management cycle

The Disaster Management Cycle is shown in Figure 1.2, demonstrates the four phases, namely; *Preparation, Response, Recovery and Mitigation.* In terms of nursing, there will clearly be differing contingencies and foci depending on which phase of the disaster that is being addressed.

Public health is increasingly concerned with the entire health system, but it is pointed out by the Sendai Framework for Disaster Risk Reduction (DRR) (UNISDR 2015), that it is important to upgrade preparation and training of health care workers on preparedness plans. Connected with this, Lo et al. (2017) suggests that Health Emergency and Disaster Risk Management (Health-EDRM) have emerged as an umbrella field that encompasses emergency and disaster medicine, DRR, humanitarian response, community health resilience, and health systems resilience. The present work has thus, the focus based on a

Disaster Management point of view rather than from the perspective of Public Health Emergency Management, especially as the present study is based on sparsely populated rural communities with large distances between health centres and not urban communities including large hospitals with Accident and Emergency units. The Sendai Framework for Disaster Risk Reduction and its relevance is further discussed in Chapter 2, Section 2.7.

Importantly, the concept of disasters used in this thesis incorporates human-made disasters[8] that are caused by failure in the technology and technology components[9] (see Coppola 2015, p. 42). Examples include aeroplane crashes[10], bridge and power plant disruptions and building collapses. This has bearing for community nurses since these may often be the types of disasters that are most likely to be involved in or response to. An illustrative example in Norway was the very recent residential area destruction in Gjerdrum outside Oslo[11]. Moreover, it is also notable that contemporary studies of disasters have highlighted their growing complexity and potential to 'cascade'. For example, an illustrative example of a natural disaster that cascaded to have major human-made implications was the Fukushima Daiichi Nuclear Power Plant in Japan that suffered a meltdown in three reactors after being impacted by a tsunami where more than 100,000 people were displaced (Coppola 2015, p. 126).

Disasters can also have unexpected effects such as the volcanic eruption in Iceland 2010, which paralyzed air transport in Europe for nearly two weeks (Choi 2012). Both natural and human made disasters have significant effects in both sparsely populated rural as well as densely populated urban regions and can have considerable longevity that nurses need to cope with. Even if the effects of a disaster in the different regions may be diverse, they may threaten the peace and order of society (Boin 2005, p.1).

This brief analysis suggests that understanding the nature and growing complexity of disasters that result in significant loss of life and affect entire communities represents a significant challenge for nursing and that a disaster management approach is important and appropriate in this context. Indeed, there will always be a need for improvement in

[8] Also called or named man-made disasters
[9] https://www.technologyreview.com/2002/06/01/234859/10-technology-disasters/
[10] https://www.bbc.com/news/world-10785301
[11] https://www.nrk.no/norge/sju-personer-bekreftet-omkommet-etter-skredet-i-gjerdrum-1.15310743

nurse's disaster training and education according to Alkhalaileh (2020) and Grochtdreis et al. (2016) both at national and international levels.

1.2 Disasters in Norway

In an international context, although in global terms often on a smaller scale, Norway has also experienced disasters with tragic outcomes. A summary of disasters and larger accidents in northern Norway since the 2nd World War is provided in Table 1.1. Significantly, many of the disasters occur far away from city centers with hospitals.

Although the number of casualties may appear low in international terms, they must be seen in relation to the sparse population in these northern areas. The present Pandemic and the 2011 terror attack are included to provide further insight (see also Appendix 4).

Table 1.1 Major disasters and accidents related to northern Norway since 2nd World War. Most of the disaster or accident sites are located far away from nearest hospital.

Name of Disaster	Location	Type of Disaster	Date	Number of dead
«Brattegga»-forliset	Nordland, Laukvik in Vågan	Shipwreck	30 march 1946	14
Kvitbjørn-ulykken	Nordland, Lødingsfjellet Aircraft crashed into mountain	Aircraft disaster	28thaugust 1947	35
Dunderlandsdal-ulykken	Nordland, Dunderlandsdalen	Bus crash	5. july 1948	16
Kings Bay-ulykken 1948	Svalbard, Ny-Ålesund	Mining disaster	14. september 1948	15
Kings Bay-ulykken 1953	Svalbard, Ny-Ålesund	Mining Disaster	19. march 1953	19
Snøskredulykkene i Lofoten og Vesterålen 1956	Nordland, Lofoten, Vesterålen	Avalanche	7. march 1956	21
«Pelagia»-forliset	Nordland, sør for Skomvær i Røst, Lofoten	Shipwreck	15. september 1956	32
Kings Bay-ulykken 1962	Svalbard, Ny-Ålesund	Mining disaster	5. november 1962	21
Grytøya-ulykken	Troms, Grytøya nær Harstad	Aircraft disaster	11. july1972	17
«Gaul»-forliset	Finnmark, Nordkappbanken	Shipwreck	8. february 1974	36

Mehamn-ulykken	Finnmark, Nordkyn	Aircraft disaster	11. march 1982	15
Vassdal-ulykken	Nordland, Vassdalen (Narvik)	Avalanche	5. march 1986	16
Torghatten-ulykken	Nordland, Torghatten	Aircraft Disaster	6. may 1988	36
Operafjellulykken	Svalbard, nær Longyearbyen	Aircraft disaster	29. august 1996	141
Barentsburg-ulykken	Svalbard, Barentsburg	Mining disaster	18. september 1997	23
Terrorangrepet i Norge 2011	Oslo, Regjeringskvartalet and Buskerud: Utøya in Hole	Terror attack	22. july 2011	77
Koronavirusutbruddet i 2020	All of Norway	Pandemic, still continuing	2020–	200+

It is also important to recognise that regardless of size, recent disasters and near disasters can imprint upon national memories and raise public expectations of learning from past experiences. Natural disasters, such as the Vassdal disaster of 1986 where 16 young soldiers were killed in a snow avalanche, resulted in significant calls for more effective disaster response.[12]

In 2019, a near disaster took place off the northern coast of Norway when the cruise ship "Viking Sky" with a total complement of 1,373 people on board, consisting of 915 passengers and 458 crew, suffered an engine failure and nearly went aground. A large airlift of passengers took place in gale force winds as the ship drifted to only 100 meters from underwater rocks before engines were eventually started. Reports from the accident, highlighted that if the ship had drifted onto the rocks, there would have been sizable numbers of casualties [13]. It is also important to note that these regional occurrences have also assumed even greater attention among Norwegians since the impact of high-profile national events, such as, the Utøya terrorist attack in 2011, have raised national awareness among Norwegians more generally as to their vulnerability to natural and man-made hazards. Furthermore, the terror attack on Utøya in 2011 - where 77 people, most of them young people, were killed – also revealed significant weaknesses in response and led to notable public scrutiny (Wistrom et al. 2016). From the perspective of this thesis, this brief review of disaster in Norway illustrates a growing expectation that Norwegian

[12] https://no.wikipedia.org/wiki/Vassdal-ulykken
[13] https://www.dsb.no/rapporter-og-evalueringer/evaluering-av-viking-sky-hendelsen/

authorities, including medics and nurses should be better prepared for disasters with notable reputational risk to the profile of nurses if they are found wanting.

Finally, the present pandemic has demonstrated the considerable fragility of modern society. Because of these high risks that disasters entail, it is important that communities and their local governments increase society's resilience. There can also be variations across Norway in terms of vulnerability, given that it is a diverse country with both rural and urban regions where a large part of the rural regions are north of the arctic circle. These regional variations in Norway present particular challenges in terms of enhancing the resilience of communities not least because there is often a long distance between hospitals and health personnel that restricts their immediate availability as first responders.

Furthermore, the unpredictability and severity of arctic weather may result in difficulties and fatal delays both in terms of communication and transport affecting disaster relief. A recent UN report (2020) [14] explains that the Arctic regions are also likely to experience more extreme weather in the future and thus will encounter possible natural disasters in years to come. One consequence is that nurses are expected to be involved with disaster response and recovery even if they work in hospitals and community-based health services (Jahner et al. 2020; Kulig et al. 2017; Rokkas et al. 2014). This means the nurses working in rural and remote areas have to deal with conditions and medical cases in a context of isolated practice and limited access to advanced care services (McCullough et al. 2020; Kulig et al. 2014). This suggests that these nurses have a need for training and education as well as participation in exercises, which should be beyond the norm (Alkhalaileh 2020; Grochtdreis et al. 2016; Kulig et al. 2017).

1.3 Disaster Nursing Concept

When introducing the Disaster Nursing Concept, it is also important to examine nursing education in Norway because a Disaster Nurse has to be identified as a part of the Norwegian framework in the present study. A nurse educated to BSc level in Norway will have half the degree duration of total practise at different locations and/or hospital departments as part of the three years degree qualification. Norwegian higher education adheres to the Bologna agreement on higher education. This degree format is the standard of education and training for nurses throughout Norway and is based on national

[14] https://news.un.org/en/story/2020/06/1066882

guidelines for nursing education. This BSc forms the general nursing education to become a registered nurse. Any specialisation within nursing in Norway has to be post graduate education, either as a post graduate course or a master degree (MSc) within the particular specialisation. Typical specialist areas which require a post graduate course or an MSc are midwifery, intensive care nursing, geriatric nursing and psychiatric nursing. Probably the majority of registered nurses in rural northern Norway are educated to BSc level and these are the nurses that will work as municipal nurses in home care as well as care homes. Education of nurses in Norway is further discussed in Chapter 2, Section 2.3.1.

It would seem then that at present there is a growing focus on the role of nurses in disasters – although it is important to stress that this is not something entirely new. Since the time of Florence Nightingale, nurses have contributed to health care to help people in need and are at the forefront of the health care response to disasters (Powers 2010, p 3). Nevertheless, the International Council of Nurses (ICN)[15] argues that nurses are still an underused resource in disaster risk reduction, response and recovery around the world (ICN 2019). Furthermore, ICN believes that nurses' involvement is essential in preventing, reducing hazard exposure, preparedness, response and recovery of disaster to strengthen the communities' resilience (ICN 2019). This view is supported by Veenema et al. (2016), who argue that nurses are the largest work force in health care and they play an integral role in disaster response and preparedness. To construct a resilient community there is a need to look at the resources that the community have and take these resources into consideration and then decide how they could be used (de Bruijne et al. 2010, p. 21; Hunter Revell and McCurry 2010). Therefore, nurses' expertise should be taken into consideration and they should also be involved in disaster planning work (Veenema et al. 2016).

What perhaps is more recent is that debates have begun to focus on notions of 'disaster nursing' more specifically. Indeed, growing awareness of disasters facilitates and opens up discussion in relation to 'disaster nursing'. But what is it? Disaster Nursing (DN) can be briefly defined as providing holistic nursing to affected populations in all phases of a disaster. However, there is no exact definition for Disaster Nursing in relevant literature, but the goal has been defined several places such as by WHO and ICN (2009) and Powers

[15] International Council of nurses (ICN) is a federation of more than 130 national nurses' associations (NNAs). The council is operated by nurses and works to ensure quality nursing care for all. ICN also work to build relationships internationally and work with specialised agencies for the United Nations system such as Worth Health Organisation (WHO). icn.ch/who-we-are.

(2010, p. 3) which will be used in this thesis:

"The goal of Disaster Nursing is ensuring that the highest achievable level of care is delivered through identifying, advocating, and caring for all impacted populations throughout all phases of a disaster event, including active participation in all levels of disaster planning and preparedness" (Powers 2010, p. 3).

Yet, it seems clear that Disaster Nursing is still emerging as a focus in terms of both nursing studies and nursing practice. This has been identified particularly at the international level, The World Health Organisation (WHO) and International Council of Nursing (ICN), for example, have highlighted the need - in the current climate - for building a capacity of nurses at all levels to safeguard the population. Work in this regard has already begun. A framework for Disaster Nursing competencies has been developed that seeks to provide guidance on how the role and skills of the generalist nurse should be adapted in the context of different global nursing frameworks (WHO and ICN, 2009). The WHO and ICN specified that the framework should be a foundation for discussion and interpretation in each country to ensure that this reflects the nations need and requirements for a disaster nursing workforce (ICN and WHO, 2009, p. 7). Furthermore, they (ICN and WHO, 2009, p. 7) also specified that because of the rapid changing disaster environment, increased research and changing technology, the disaster nursing competences must be reviewed and revised regularly. At the very least, some effort has thus been put in in terms of trying to identify further how 'nursing for disasters' can be improved upon even if we may be some way from developing a comprehensive concept of disaster nursing (see also Chapter 2).

1.4 Nursing in Norway and the Norwegian Rural Arctic Areas

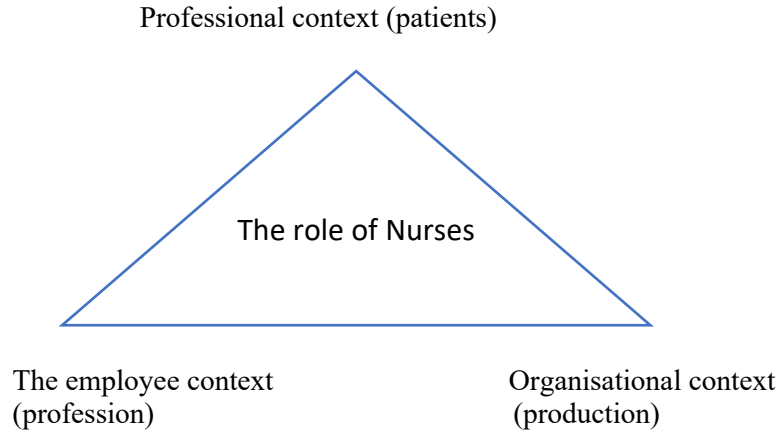
It is also important to recognise that disaster nursing must be compatible with the demands and requirements of general nursing and community nursing. Nurses play an important role in the health system since they are the largest health care workforce and International council of nurses (ICN) defines nursing (short version) as follows:

"Nursing encompasses and collaborative care of individuals of all ages, families, groups and communities, sick or well, and in all settings. Nursing includes the promotion of health, prevention of illness, and the care of ill, disabled and dying people. Advocacy, promotion of safe environment, research, participation in shaping health policy and in patient and health systems management, and education are also key nursing roles" (ICN 2002).

The definition highlights the multiple responsibility nurses have in their daily work. This

can be seen in a way that the role of nurses transcends three interlinked contexts of work; the profession context, employee context and the organisational context, see Figure 1.3 (Orvik 2011, p. 26-27). Successful nursing requires nurses to be able to 'move' between these three work contexts as seamlessly as they can.

Figure 1.3 The Working Contexts of Nurses



(Orvik 2011, p. 27)

Importantly, contemporary community nursing requires successful nurses to be able to move and transcend between these different contexts (see Figure 1.3) and this particularly applies to homecare nurses who work in a community setting. This is particularly important since any attention to increased disaster competencies needs to be placed in the context of already demanding working conditions and practice. In Norway, homecare nurses are having to care for greater numbers of patients that results in the corresponding need to reduce the time apportioned to each patient (Orvik 2011, p. 27). In a professional context the argument can be made that some patients require greater demands on the nurses' time and necessitate respective nurses to have higher levels of competence more than others. If we also see it from an employee context, the nurses need to manage their working commitments in order to respect and carry out normal working hours (for example, out of consideration to their family and the need to recognise the importance of rest and recovery from their demanding responsibilities). So often nurses in Norway are pressured to work longer hours from an organisational context and in many instances, nurses use their own spare time and competences to fill the gaps left by challenges to working place resources (Orvik 2011, p. 27). This explains the nurses' movement through the three contexts.

Because Norway is largely rural with long distances to travel between hospitals in

frequently difficult terrain and with geographical features such as fjords, and in some regions, as in the northern part of Norway, it is also far between medical practitioners and it may thus take a very long time for them to reach a disaster area, as shown in Figure 1.4. The effect of geographical features can be demonstrated by the fact that the road distance from Kirkenes to Hammerfest is 485 km and the road distance from Hammerfest to Tromsø is 450 km, whilst the aerial distances are 261 km and 211 km respectively. Consequently, it is even more important in the remote regions than in the urban areas that nurses have both medical and disaster management skills and can combine theoretical knowledge and understanding when to contact and require specialist support or advice with their understanding of the rural community, potentially to reduce the impact of a disaster (Menegat and Witt 2019; Kulig and Smolenski 2014). As shown in Figure 1.4, there is a considerable distance between hospitals in this rural area with a sparse population, thus in these regions, it is important that everybody who could be involved, knows what to do if a disaster strike.

Since nurses working in rural areas often need to lead in emergency situations, their competences are important. This is supported by a Norwegian report by Nordlandsforskning (2013), where findings highlighted the need for a better framework and outlining the length of the 'following-up' process, resourcing requirements and availability and access of competent staff, trained in leading this work in the aftermath of disaster.

The 2013 study interviewed nurses who had been involved in the Utøya terror, see Table 1.1. The study found that on average only 2.48% of the nurses had sufficient knowledge of how to handle a crisis or disaster based on what they learned at their BSc in nursing. Similar conclusions can also be found in the literature study by Rokkas et al. (2014). Furthermore, the Norwegian study by Nordlandsforskning (2013) also shows that a little more, 3.09%, of the nurses did have competence in crises/disaster work from postgraduate education. Whilst there is an apparent need for disaster related topics in Norwegian nurses' education, this need for implementing disaster nursing topics is also proposed by several international nursing groups (Alkhalaileh 2020; Nejadshafiee et al. 2020; Susanti et al. 2019; Veenema et al. 2016; Nilsson et al. 2016).

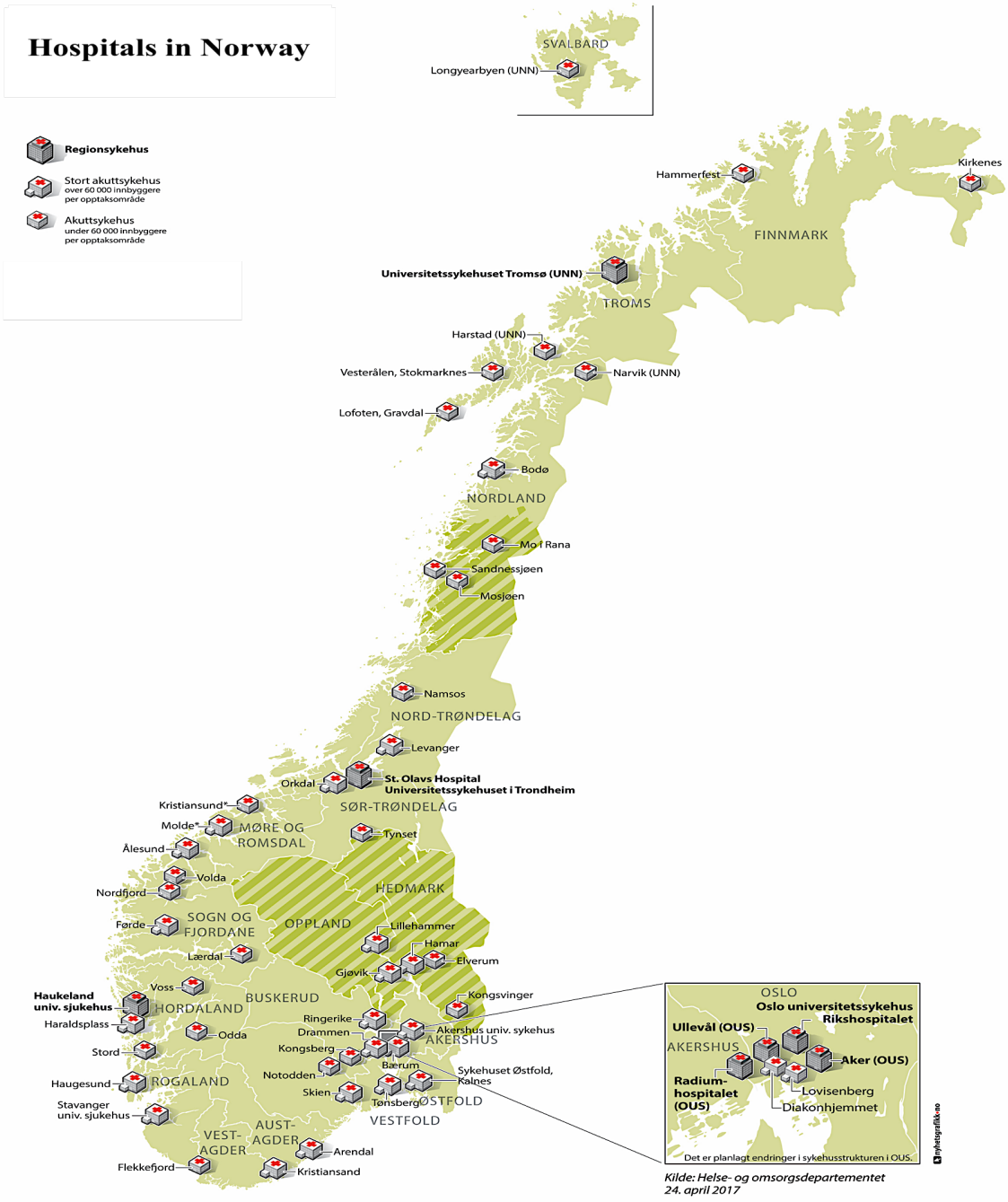
With this in mind, the role of nursing in handling disasters and long-term implications of disaster management is important to establish, especially in crisis aftermath and

particularly in terms of nursing ‘follow-up’. How this work is handled can have a large impact on the people living in the community and therefore also on the resilience of the community (Powers 2010, p 24).

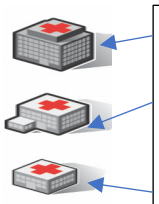
In Norway, long-term care is often carried out by health care personnel in the local community. These are frequently nurses who meet affected people requiring nursing care and treatment; there is neither any automatic follow-up for bereaved people. During a crisis/disaster, crises teams are often appointed based on who should take care of those affected by the event. Yet, when the crisis team is no longer involved, the follow-up process is dependent on the community nurses and in rural area this is often home care nurses. Therefore, there is a need to identify disaster nursing practices and training programs to prepare nurses (Alkhalaileh 2020; Grochtdreis et al. 2016; Bahrami et al. 2014; Lereim et al. 2012; Yamamoto 2013).

It is frequently stated that all disasters are local in as much as that the impacts are first and foremost felt by the local community where the disaster starts and ends (Pearce 2003). A corollary of this is that community or homecare nurses are at the forefront of transcending the three work environments suggested by Orvik (Orvik 2011, p 27). This thesis therefore focuses on the municipal or in other settings named the community nursing level since it is often very likely that these particular groups of nurses in combination with the recognised community style of nursing provide an important research area in discovering the parameters and the cutting edge of dealing with disasters that have multiple and diverse effects on local communities and individuals.

Figure 1.4 Overview over Norwegian Hospitals with Accident and Emergency units



Source: The Norwegian Government Health-and caring department, 24 April 2017. https://www.regjeringen.no/no/tema/helse-og-omsorg/sykehus/nasjonal-helse--og-sykehusplan2/nhsp-2015/kart-over-norges-akuttsykehus/id2551362/



Regional hospitals

Larger hospitals with Accident and Emergency (A&E) units in a region with more than 60 000 inhabitants

Hospital with Accident and Emergency (A&E) units in a region of less than 60 000 inhabitants

1.5 Disaster Management vs Public Health Emergency Management

International agreements concerned with disaster management such as the Hyogo framework for action (HFA) from 2005 (UNISDR 2009) has a clear focus on disaster risk reduction (DRR). Health is barely mentioned in the HFA and in fact, it is only referred to a few times. However, it is at the Sendai meeting in 2015 (UNISDR 2015) and with the Sendai Framework for Disaster Risk Reduction (SFDRR) that for the first time, health has become an important, significant and integral part of DRR. Disaster deaths are rarely due to infectious diseases other than through epidemics and pandemics, this is an important consideration when measuring up disaster management against public health emergency management (PHEM), as a substantial activity of PHEM has traditionally been concerned with infectious diseases, mass casualty and CBRN incidents (Selwood and Wapling 2016). Disaster deaths take place due to a variety of causes that may include blunt trauma, drowning, and forest fires or building collapses (Aitsi-Selmi et al. 2015). In addition to significant physical injury or diseases, those affected can be left with short- and long- term mental health consequences. Extreme events such as disasters can be a source of great stress to people, families, and entire communities because of their inherent effects. Post-traumatic stress disorder (PTSD) is the most frequently studied manifestation of the psychosocial stress caused by disasters, but other mental health impacts may include general distress, anxiety, excessive drug or alcohol consumption, and other psychiatric disorders (Aitsi-Selmi et al. 2015).

In addition to the potentially narrow focus of PHEM it is also evident as Ramsbottom et al. (2018) states, that the Public health emergency preparedness (PHEP) is all too often focussed on institutions while overlooking the capabilities of communities in contrast to the present study which deals with remote arctic, rural communities. PHEM also largely treats the role of nurses implicitly as demonstrated by a paper on preparedness for cross-border threats in the European Region by Stoto et al. (2017). The PHEM system is often emphasised by public health related studies, but they do not deal with staff specific roles such as those of nurses (Stoto et al. 2017; Schnall et al. 2017). A comparatively recent study from the USA which considers the role of the public health nurses during disaster preparedness shows that public health nurses do not have a clearly defined role when responding to a disaster (Rivera-Rodriguez 2017). Evidently, there is a need for public

health nurses to have clearly defined roles in disaster preparedness as well as in all parts of the disaster management cycle (Figure 1.2) and they need to acquire the necessary skills and knowledge to respond to disasters and emergencies (Rivera-Rodriguez 2017).

A recent, but limited German study by Grochtdreis et al. (2020) concludes that the exploratory study demonstrates that German nurses need to get more involved in all aspects of disaster management and need to receive proper education and training and that the federal states of Germany need to organise regular and mandatory disaster drills for nurses

The review part of the study by Rivera-Rodriguez (2017) as well as the current study show that there is a paucity of studies of the role of nurses in public health emergency management and thus the contribution of PHEM studies to disaster nursing concepts and studies has been so far limited both in theory and in practice.

The disaster management SFDRR proposes an all-hazards approach that incorporates and includes when health is a significant part of DRR. It is for the above reasons that the present study adopts a disaster management approach, a focus on disaster and all nursing activities associated with disaster rather than the potentially narrower view of PHEM. This choice is further supported by Table 1.1 which presents major disasters and accidents in Norway since 2nd World War and demonstrates that deaths and injuries are likely to have been caused by drowning, blunt trauma or fires with the exception of the current Covid19 pandemic.

The Sendai Framework for Disaster Risk Reduction and its relevance is further discussed in Chapter 2, Section 2.7. For this thesis it is notable that the Sendai Framework for Disaster Risk Reduction (DRR) (UNISDR 2015) highlights that it is important to upgrade preparation and training of health care workers and thus nurses on preparedness plans

1.6 Research Challenge

Growing awareness of both natural and human made disasters may have increased substantially in recent years across the countries of the West; yet it has also contributed to an increased assumption that there is a rising need for more competent health care workers. The nursing profession recognises the growing importance of disasters on nursing both in theory and practice. However, there is more work to be done, certainly

from a practice side, as there has been little attempt to link the concepts and theories together. Perhaps this lack of ambition may actually be undermining the effectiveness of the nursing profession in handling disasters now and in the future. It is also very visible and rather striking that even in places where high quality nursing practice is already recognized as being in existence, such as Scandinavia, equivalent debates on Disaster Nursing are only just emerging, and even more, that the link between Disaster Nursing and Disaster Management remains ambiguous and lacking in clarity.

1.7 Identifying the Research Gap

So, let us establish and identify the nature of an important research gap that this thesis addresses and demonstrate the new contribution to knowledge that it seeks to begin to define. Crucially and importantly, the theoretical and conceptual underpinnings for Disaster Nursing are largely missing to date. Although there are several nursing theories that have been developed to cater for different nursing topics, it still remains the case today that there is no specific Disaster Nursing theory (Alkhalaileh 2020; Nejadshafiee et al. 2020; Pourvakhshoori et al. 2017a). Indeed, whilst we are still some way from seeing a specific theory of Disaster Nursing emerge, the development of an even more comprehensive conceptual framework for Disaster Nursing is a major research gap; and this represents an important focus for the present study. Developing stronger conceptual elements or even an over-arching Disaster Nursing concept will have an impact on the development of a broader Disaster Nursing framework which at present is based primarily on the experience and practise of nurses who have worked in disasters. Further, conceptualising of Disaster Nursing will also and consequently affect the educational goals of Disaster Nursing studies. It will also identify the specific roles of Disaster Nursing and help to identify the nursing part of disaster management which is also lacking. The focus of Norway which is an affluent and developed nation as defined by both OECD and IMF (section 1.0), allows comment to be made on rural and sparsely populated regions. At the start of a disaster such regions are low on equipment and staff which requires good managerial as well as nursing skills to ameliorate.

1.8 Aims and Objectives of the Study

Given the identification of the Research Gap, the aim of this thesis is as follows:

To critically evaluate the present and future requirements of Disaster Nursing using rural northern Norway as a case study.

Objectives:

- To examine if there is a need for disaster nursing as a sub field (Disaster Nursing) in Norway or if it is just nursing as usual but in a different environment (Nursing in Disaster).
- To critically investigate how nurses are involved in Disaster Management teams and in disaster plans, especially in rural communities
- To develop a disaster nursing conceptual framework using Norway as a case study.
- To draw conclusions and make recommendation for nursing policy in Norway based on research findings.

Research Questions:

Therefore, by undertaking a case study in northern rural Norway in particular, a country and region where few studies have been conducted so far, this thesis will be able to investigate three key research questions, such as:

- Is there a need for Disaster Nursing as a subfield in Norway or is it nursing as usual but in a different environment?
- How are community nurses presently involved in Disaster Management teams and in disaster plans, especially in rural communities in Norway today?
- What future changes are required in nursing education provision in Norway to facilitate better disaster nursing in Norway?

1.9 Structure of the Thesis

The thesis is divided into seven chapters with “Introduction” as the first chapter. The introductory chapter gives a presentation of the areas, geographical regions, concepts, functions and organisations being subject and foci of the study. Furthermore, the aim, objectives and research questions of the thesis are also presented.

The second chapter is called “Understanding the conceptual landscape – A Selective Review of the Literature”. This chapter introduces a survey of selective, key literature especially relevant to nursing and disaster applicable nursing. The survey is also inclusive of descriptions of relevant official international and national Norwegian documents.

In the third chapter, the thesis introduces a distinctive DN-ND Conceptual Framework that includes a typology for understanding how Disaster Nursing is or could be developed, introduced and launched. Because the typology provides a conceptual framework for the study, the chapter is entitled “Research Approach and Concepts”.

The fourth chapter describes the research method inclusive of the philosophical foundation. The chapter also offers necessary information about the participants or informants of the study and the interviewing, recording and transcription processes. The chapter is called “Methodology and Methods”.

It is followed by the empirical work, chapter five, which details the results of the interviews. The chapter is organised in a manner to support the understanding of the narratives and gives relevant citation examples translated from the native Norwegian to English. The resulting data are presented in the context for nursing and disaster nursing. The chapter is called “Empirical Results and Findings”.

The analysis of the results and findings from the interviews are presented in chapter six. These results are also compared with the findings from applicable and relevant national and international literature. The analysis is also merged and juxtaposed with the conceptual framework as detailed in chapter three. A brief summary of the analysis is given at the end of the chapter which is named “Discussion”.

The summary from the present perspective of the DN-ND framework is offered together with conclusions from the research questions in chapter seven. This is the followed by the implications for future research and recommendations both for future nursing practise and education. As chapter seven encompasses both research conclusions and recommendations , the title for the chapter is “Conclusions and Recommendations”.

Chapter 2

Understanding the Conceptual Landscape – A Selective Review of the Literature

2.0 Introduction

Dealing with disasters has been an important consideration for society over a very large period of time. In modern times the management of disasters or disaster management has been a field of both academic and practical studies. There exists currently a large number of text books, academic works, journal and conference papers pertaining to the subject (Coppola 2015; Veenema and Woolsey 2013). The focus of the present study takes a health care view or more precisely the view from the nursing profession of dealing with a disaster or disaster management. The resulting documentation and discussions from the World Health Organisation (WHO) sponsored Sendai conference in 2015 (UNISDR 2015) as well as the earlier Hyogo conference of 2005 on Disaster Risk Reduction (UNISDR 2009) has driven the health care dimension of disasters into focus more sharply. It has become clear that nurses in particular are important in order to reduce the effect of a disaster on the affected population.

The term "Disaster Nursing" has been coined and the framework of competencies or required skills of nurses in a disaster has been proposed both by the International Council of Nurses (ICN) and WHO (WHO and ICN 2009). However, both countries and organisations have been slow to adapt or implement the framework. Consequently, this literature review deals with the published concepts, experiences and proposals related to and written by nurses as well as documents important for the functioning of nurses in a disaster setting.

2.1 Disaster Management and Resilience

Authors in the nursing field have studied the effect of disasters from numerous points of view, but there is clearly more to be done. In general, most papers and documentation are written by researchers from the Pacific Rim area which may reflect the occurrence of many natural disasters in this region. The nurses there have been concerned over a considerable time with their role in disasters. Similar findings were acknowledged by

Grochtdreis et al. (2016) in their review which provided an overview of nurses' role, knowledge and experience in national disaster preparedness and emergency response. Furthermore, the study also discovered a lack of disaster nursing studies in Europe and Scandinavia (Grochtdreis et al. 2016).

There are - in particular - several notable gaps in terms of knowledge and execution of Disaster Nursing and they are particularly:

(i) Disaster Nursing in Norway specifically rural communities.
(ii) Disaster Nursing and the Media and Technology.
(iii) Disaster Nurses leadership role in mass casualty and disaster
(iv) Representation of Disaster Nurses in Disaster planning teams.
(v) Education and training of nurses in Disaster management.

There are relatively few papers written by nurses from Norway (Holdo et al. 2017) and it is clear that Disaster Nursing in the community and rural areas is important because of the sparsely populated country and the remoteness of many of its communities. The remoteness is readily displayed by Figure 1.4 in the previous chapter which also illustrates the small number of hospitals in northern Norway and the considerable distances between the hospitals in the north. Figure 2.1 shows the distribution of municipalities in northern Norway. The colouring gives the population density from comparatively high (red) to low (dark blue). Another important concern in the remote and rural regions is the retention of health professionals especially in these northern peripheries. This is discussed by Carson et al. (2015), who point out that specific policies to facilitate movement and give bonuses to health professionals in order to retain them in rural regions. Retention of rural nurses is also a topic and focus of a study from rural Canada by MacLeod et al. (2017) citing a decline in the number of rural nurses. A further concern related to nurses working in rural areas is the under reporting of distressing events that they experience as pointed out by Jahner et al. (2020). The above concerns exacerbate the situation in terms of rural Disaster Planning and Disaster Health Planning suggesting that it is very timely to deal with both planning and education of Disaster Nursing so that also these communities can be resilient.

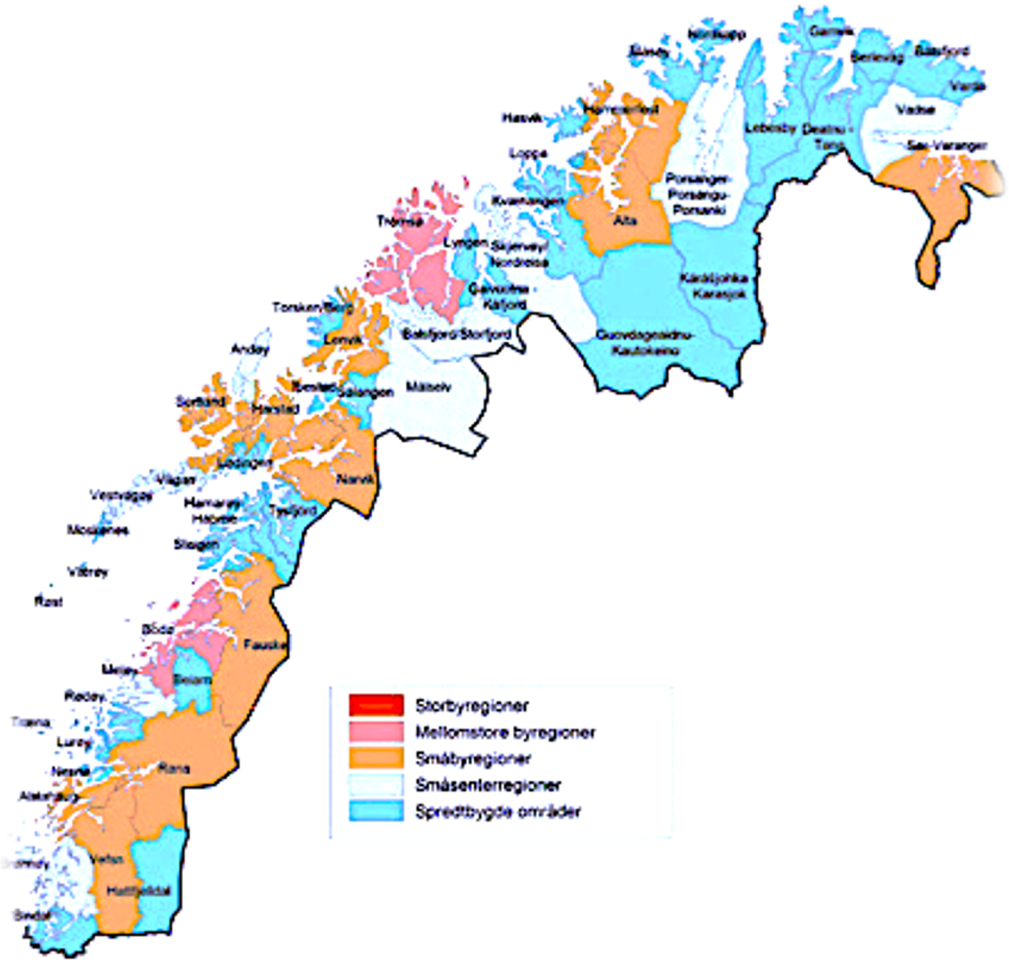


Figure 2.1 Distribution of Municipalities in the North of Norway. The population density is given by the colouring from comparatively high (red) to low (dark blue).[16]

2.2 Disaster Nursing Literature, what Concept or Theory exists and is there a Model?

A review of the literature shows that there is no major Disaster Nursing conceptual framework at present. This is underlined by the recent review of Pourvakhshoori et al. (2017a) – although it was also suggested in a number of research papers that some aspects of existing nursing theories and models can be selectively used and have some added value in terms of furthering the study of, and research, in disaster nursing. More

[16] https://www.regjeringen.no/globalassets/documents/rut2013/rut_2013_linked_l.pdf

specifically, there were two articles that considered possible theories for selective use in disaster nursing. The first article examined the nursing caring models. Only one author, to that date, has examined the nurse's role when caring for a community in a natural disaster context (Sterling 2014). The study shows how caring theories could be used as a framework in Disaster Nursing. She selected five different caring theories and combined caring topics from the theories that could be used in a Disaster Nursing framework (Sterling 2014) (Figure 2.2). It would seem then that caring theories – that already have a recognised place in nursing studies – might offer some useful approaches to the particular field of Disaster Nursing.

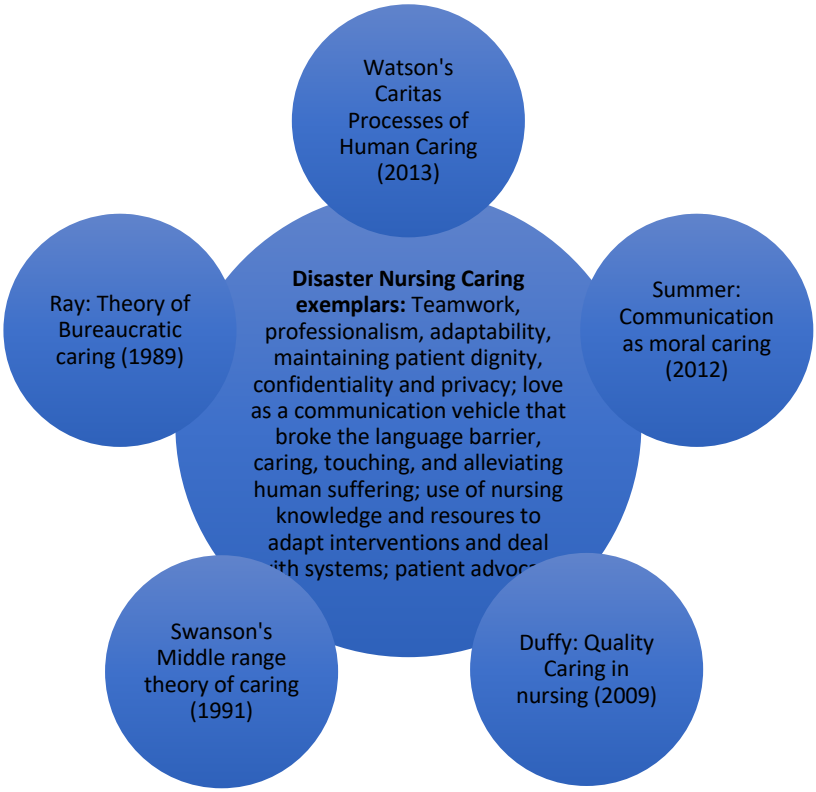


Figure 2.2 From Sterling (2014) Disaster Nursing "Caring" exemplars and selected theories.

However, these caring exemplars are located firmly within ordinary nursing practice. The speciality with caring – before, during and after a disaster - is not considered explicitly, in a holistic manner or put forward strongly in Sterling's Disaster Nursing "Caring" exemplars. A SWOT analysis of respective theory and models associated with caring theory and practise nursing models is presented at Table 2.1. The main conclusion taken here is to confirm and demonstrate that caring theories cannot substitute for the fact that there is no dedicated international Disaster Nursing theory or model. The analysis

presented in Table 2.1, indicate strongly that caring is subjective and depends on the 'giver' and 'takers' preconceptions. Therefore, using only caring theory in a framework for Disaster Nursing will not be specific enough or robust enough to explain all of the major dynamics and elements as regards to nursing in a disaster event.

The conclusion of Sterling (2014) is compatible with those underlined by Pourvakhshoori et al. (2017a). Sterling (2014) concluded that caring theories must be used as part of a framework for Disaster Nursing practice and research, but not on their own and should not be deemed as the only theory explaining Disaster Nursing. From the perspective of this thesis then, this can be taken as strong confirmation of a need to find further contribution to knowledge; particular, those that investigate and conceptualise the speciality of nursing caring during and after a disaster event. In this way, this confirms there is much to be done to fill this particular gap in a future framework for Disaster Nursing.

A more recent study by Hugelius and Adolfsson (2019) describe a systematic literature review in order to design a model for Disaster Nursing. The study is, however, only focussed on the "response phase" of a disaster. The synthesis findings give a main theme as "Disaster Nursing crossing borders". Here the borders considered are the personal, professional and environmental borders that a nurse may encounter and have to cross in a disaster situation. Many of the examples and papers referred to are those described elsewhere in the present study and discussed in a different context. The synthesis of the content, context and essence of disaster nursing is expressed in the acronym HOPE and is based on the following: **H**olistic health assessment and promotion, **O**rganization and management of immediate response, **P**rofessional adaptation and **E**ndurance and recovery (Hugelius and Adolfsson 2019). The model proposed by the authors is the experience of work as a disaster nurse and the limitation is that the model is only related to the response phase.

So, let us now turn to a qualitative study by Pouvakhshoori et al. (2017b), it is particularly pertinent in the context of this thesis, since the author has already analysed models available for disaster nursing. The study indicates that there are many personal and professional conflicting issues for nurses in a disaster situation, in particular, the concern for their own families and being able to prioritize care in a very disorganised and uncertain situation. It is therefore a worthy addition to mapping the conceptual landscape that exists today as regards to disaster nursing. The review by Pourvakhshoori et al.

(2017a) indicates that – once again- there is no comprehensive model of Disaster Nursing and equally, that the models of disaster management are very limited and thereby have limited application in terms of Disaster Nursing.

The perspective articles and the associated approaches are mapped out in Figure 2.3. What is notable in the figure is the large number of limitations identified in relation to value added to Disaster Nursing overall, vindicating that even a broad spectrum of nursing models fails to offer a convincing combination or conglomeration. There is – in short – no current model of models (see Figure 2.3).

Table 2.1. SWOT analyses of Theory and Models.					
Author	**Article**	**Strengths:**	**Weakness:**	**Opportunities:**	**Threat:**
Pourvakhshoori et al. 2017a.	Nursing in disasters: A review of existing models	The article is based on review of articles of a period of 26 years. All models that meet the inclusion criteria were developed or available for Disaster Nursing framework. Both English and Persian documents were included in this systematic review.	Posed models focus on a particular aspect. Thus, no comprehensive model was found that could serve as a model for all nurses to be applied at the time of disaster.	Jennings-Sanders (2004) was designed as a framework for nursing education curriculum. This model is based on community health nurse and it could be adapted into a major Disaster Nursing model.	There are few Disaster Nursing models to review. Models are diverse Caring is subjective and depends on the giver and takers preconceptions.
Sterling 2014.	Nursing "Caring" During Catastrophic Events: Theoretical, Research, and Clinical Insights.	Putting five different caring theories into an example of a disaster nursing theory. This could strengthen a new theory. Some of the theory Sterling uses are more adaptive to disaster nursing than other. Incorporate Navy nurses' experiences from humanitarian work will strengthen the disaster nursing framework (for instance culture sensitive).	Using caring theories as frameworks for Disaster Nursing is very limited. The Disaster Nursing caring examples Sterling put forward, in this article, are skills that ordinary nurses should have. All of the caring theories were developed from nurses 'experiences from natural disasters. This also limits the study. Therefore, no comprehensive theory for Disaster Nursing.	All of the five caring theories could be adapted into Disaster Nursing, taken necessary skills from each of the theory and put it into a caring theory for nursing in a disaster. But it will need adding more Disaster Nursing challenges. Because caring is fundamental to all aspects of nursing, caring theory could be expanded and adapted into every part of nursing.	According to Sterling (2014) there is no consensus regarding the definition of caring. Using only caring theory in a framework for Disaster Nursing will not be specific enough for nursing in a disaster event.
Hugelius and Adolfsson (2019)	The HOPE model for disaster nursing – A systematic literature review	Based on a large number of articles and personal experience	Considers response phase only	Could possibly be used in conjunction with other theories	Difficult to use in present study

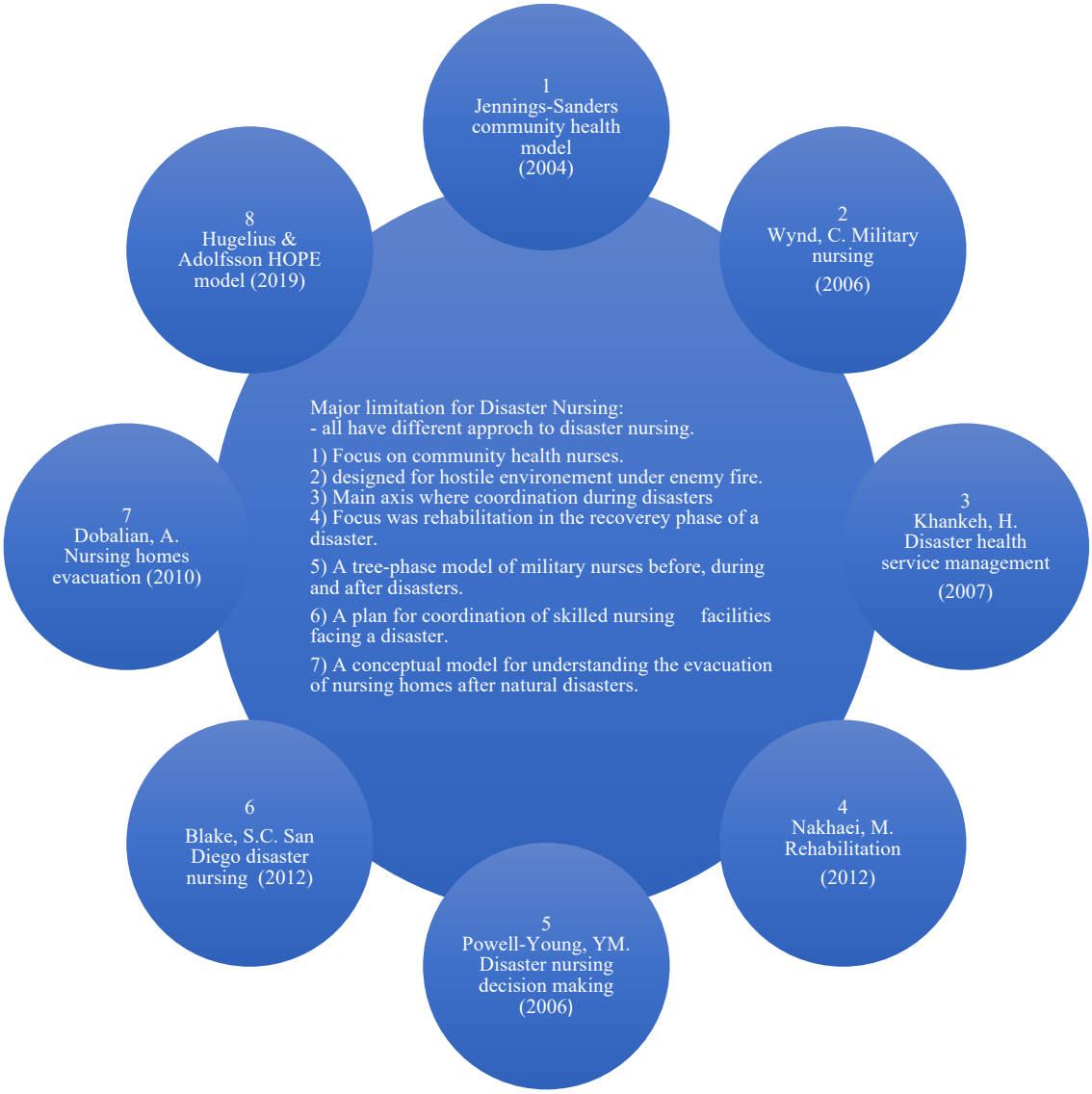


Figure 2.3 Based on Pourvakhshoori et al. (2017a) review of disaster nursing models and Hugelius and Adolfsson (2019) HOPE model.

However, we should not be overly critical here. Health care research in the disaster field is growing rapidly (Whitehead and Arbon 2010; Labrague et al. 2017; Kim and Lee 2020). Nursing research in the disaster field is confronted by notable dilemmas arising from the sheer complexity of ethical, practical and scientific challenges, as well as, the large gaps that exist in evidence-based knowledge. Few evidence-based methods are established and even fewer are well-evaluated in terms of effectiveness (Whitehead and Arbon 2010). A number of nursing studies describe research processes and the complexity of collecting data in disaster research and understanding such challenges (Murphy 1989; Winters et al. 2014). Interestingly, for the present work, it is beginning to

be recognised that the handling of disasters in rural areas presents particular problems that are not identical to those experienced in urban areas. One study - where the aim was to investigate health science in a rural area after a disaster - is presented by Winters et al. (2014). The results from the study show the importance for the researcher to first establish and strengthen the relationship with the community as a 'gatekeeper'. Furthermore, communication with diverse community members early in the study was found to be important in order to strengthen policies and improve practices based on the research findings (Winters et al. 2014). Another study by Tavan et al. (2016) developed a test scale to measure nurses' knowledge, attitude and practice related to disaster preparedness. In a similar manner Wang et al. (2019) devised a psychometric evaluation used for undergraduate nursing students. Tests for evaluating the competencies of nurses in disaster response were made and used by Marin et al. (2020). In this way, this thesis is aware of the challenges of understanding nursing in the community, their role as gatekeepers, the importance of communication and the need for effective tool-kits when thinking more clearly about disaster nursing particularly in countries like Norway that are for the most predominantly rural with substantial urban-rural differences across the country (see Table 2.1).

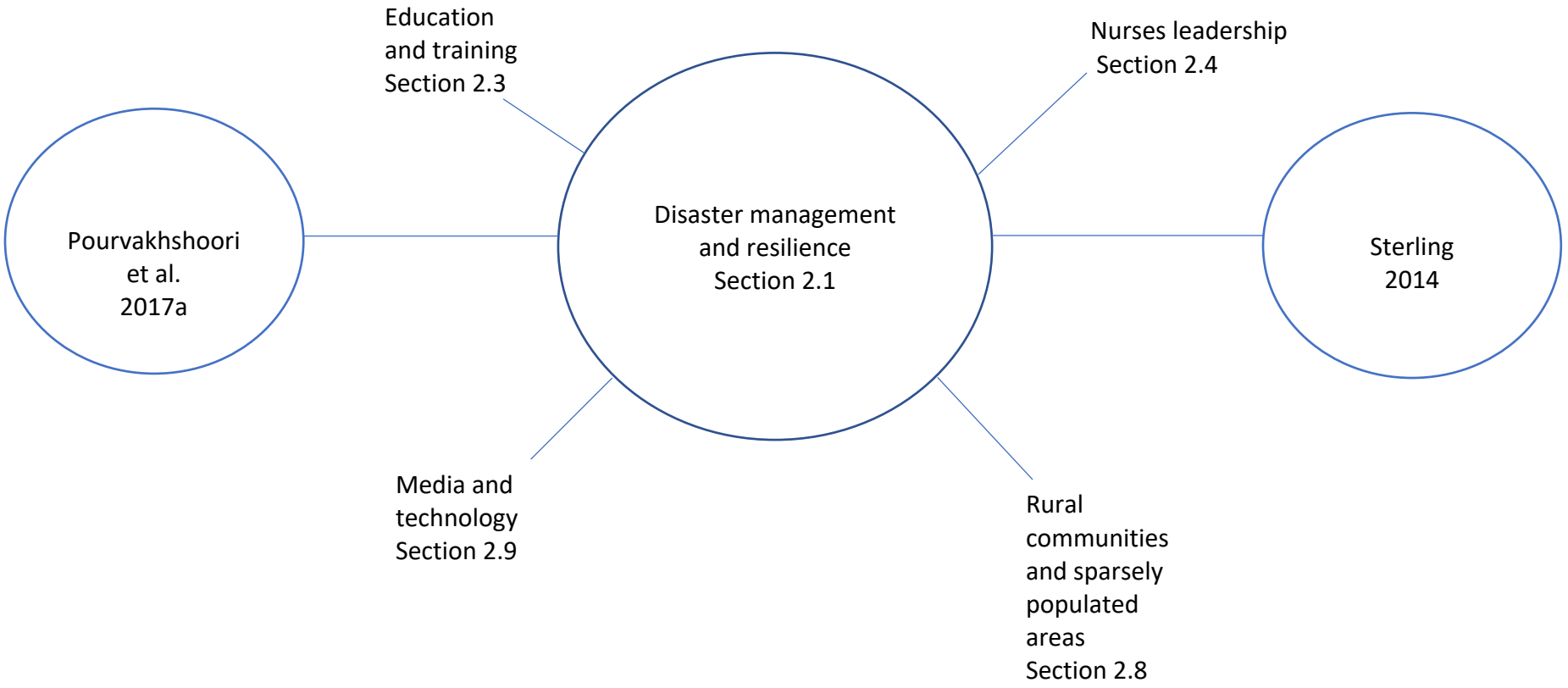
Overall then, when considering the existing landscape of theoretical works that exist stemming from disaster management a number of key observations for this study of disaster nursing can be made, namely:

- There is no universal model recognised by leading authors.
- The field of Disaster Nursing is still developing.
- There are major notable gaps.
- There are weak linkages between concepts and practice.

However, it should not be forgotten that nursing studies are driven by evidence-based practice and this represents an important dimension of the discipline as it exists today. Hence, it is not surprising that aspects of Disaster Nursing – regardless of its deficiencies are finding its way on to agendas relating specifically to professional education and training.

In Figure 2.4, the existing conceptual landscape of Disaster Nursing is therefore presented

Figure 2.4 Conceptual landscape

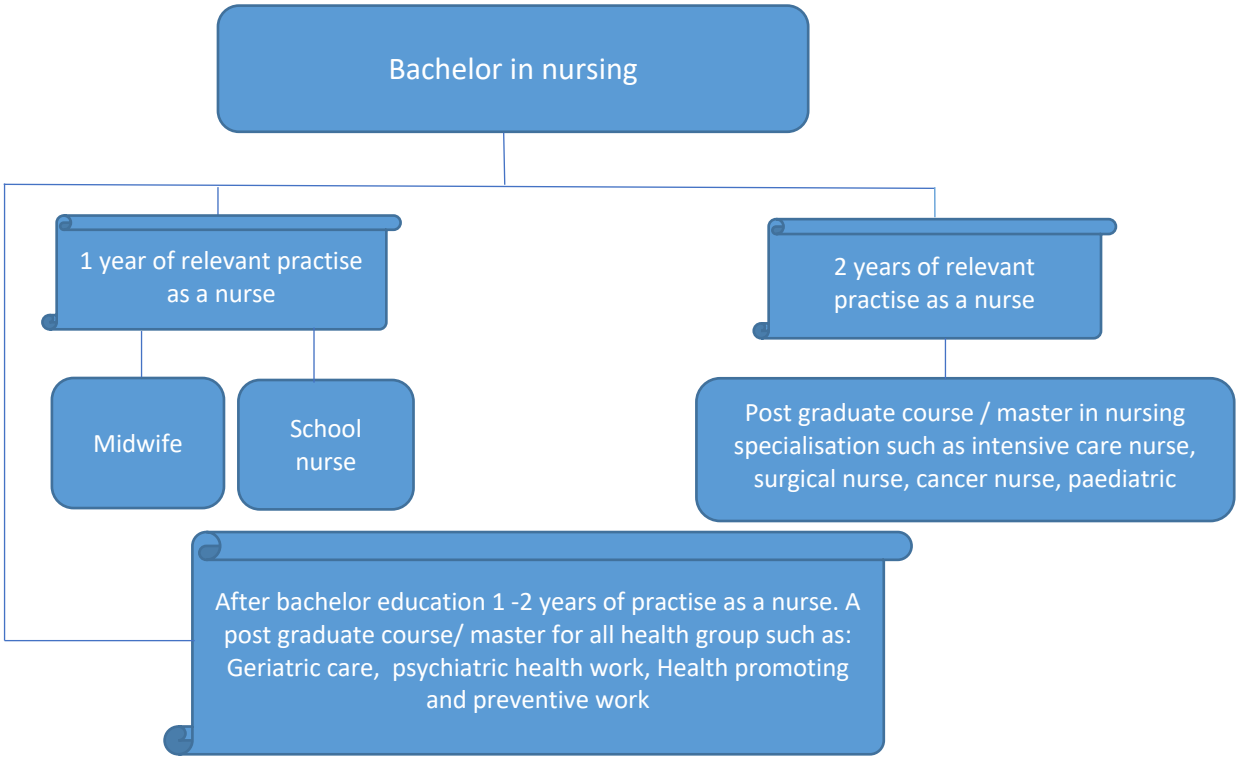


2.3 Education and Training

2.3.1 Nursing Education in Norway

The Norwegian Nurses' Organisation (NSF)[17] aimed at a mandatory law demanding three years of nursing education for all nurses. This law was not passed until 1948 (Melby et al. 2000). Therefore, to become a nurse in Norway one needs a three years bachelor education in nursing that gives authorisation as a nurse. Importantly, this authorisation stays with the nurse for all her professional life unless any mal-practise is reported. This is in contrast to other Scandinavian and European countries requiring updates and retesting at regular intervals. Nevertheless, this authorisation in Norway gives the right to work as a nurse in a hospital or as a nurse in a community health care system. However, there are some positions that demand more specific education such as midwife, where a post graduate degree is necessary, see Figure 2.5. The figure shows that a general nurse in Norway will have a three years bachelor education and after at least one or two years practice the nurse will have the opportunity for specialisation. Specialisation for nurses is either a post graduate course or a master. So, if we now look at the Norwegian nurses' bachelor and post graduate course / master education framework, there are no big emergency or disaster topics (Holdo et al. 2017).

Figure 2.5 Overview over nursing education option in Norway



[17] www.nsf.no – Norsk Sykepleierforbund

In April 2019 the Norwegian government introduced new national guidelines for the nursing educational framework starting autumn 2020 where one of the competence areas was that the students should: *"know measures to preserve life and health in mass casualties and in crisis-and disaster situations"* (translated from Norwegian regulation on national guidelines for nursing education §6 e.). The competence introduced by the new guidelines is in terms of knowledge rather than proficiency. The guidelines are not interpreted equally by each of the Universities and University Colleges as seen from Table 2.2, which gives an overview of Disaster topics in the Nursing BSc's available in Norway for the academic year 2020-21. The guidelines are just an overall view of topics and the contents are based on decisions made by the universities. Table 2.2, demonstrates that only three of the BSc in nursing offered by the Norwegian educational establishments did not include a disaster topic in their framework or study plan whilst another three of the educational programmes did not include this topic in their framework or study plan for the first year of the BSc. These findings are rather disappointing, especially since this framework has in recent years been developed at the universities nursing departments during the worldwide pandemic. However, this finding shows that there is work to be done to highlight the importance of the disaster topic among the academics of nursing education who are involved in developing the framework. The need to highlight disaster topics is important for nursing academics and not only a Norwegian issue, but it is also found in other countries such as Jordan (Alkhalaileh 2020).

Despite this, the Norwegian government has not specified any disaster topics in the post graduate studies or master degrees. It is up to the University or University college boards to decide on the contents of both BSc and MSc studies as long as they follow the regulations of the post graduate degree framework and that the institution is accredited by the Norwegian Agency for Quality Assurance in Education (NOKUT)[18] (regulation of post graduate degree framework: paediatric care, intensive care, cancer care, surgical care, midwife, anaesthetic nurse, school nurse, health promoting and preventive work, psychiatric health work and geriatric care).

[18] www.nokut.no

Table 2.2 Overview of implemented disaster topics in BSc nursing education in Norway for the academic year 2020-2021.

University College and University	Disaster topic
HiM, Molde https://www.himolde.no/studier/program/sykepleie/studieplaner/2020.html	yes
HINN, Høgskolen i innlandet https://www.inn.no/content/view/full/163539/language/nor-NO	yes
HVL,Høgskolen på Vestlandet https://www.hvl.no/studier/studieprogram/2020h/bsyk/studieplan/	No
Høgskolen i Østfold https://www.hiof.no/studier/programmer/spl-bachelorstudium-i-sykepleie-heltid/studieplaner/h2020.html	yes
LDH, Lovisenberg diakonale høgskole https://ldh.no/studietilbud/bachelor-i-sykepleie/emner/bsy-301-sykepleie-ved-akutte-sykdommer-og-tilstander	yes
Nord, Nord Universitetet https://www.nord.no/no/studier/sykepleie-bachelor?utm_campaign=studentum.no+-+Nord+Universitet+utdanninger&utm_medium=Klikk+fra+studentum.no&utm_source=Sykepleie+-+Bachelor	yes
NTNU, Trondheim, Ålesund og Gjøvik https://www.ntnu.no/studier/bspl	Not in the first year and no access to second and third years
Oslo Met, https://student.oslomet.no/studier/-/studieinfo/emne/SYKPPRA20M/2020/H%C3%98ST	yes
UiA,Universitet I Agder https://www.uia.no/studieplaner/programme/BACSPL-A	yes
US Universitetet i Stavanger https://www.uis.no/course/?code=BSY260_1&parentcat=8935	yes
UiS Universitetet i Sørøst-Norge https://www.usn.no/studier/finn-studier/helse-og-sosialfag/bachelor-i-sykepleie/bachelor-i-sykepleie-1	Not in the first year and no access to second and third years
UiT, Tromsø (Narvik, Harstad, Hammerfest) https://uit.no/utdanning/program/661259/sykepleie_-_bachelor	no
USN, Drammen, Horten and Porsgrunn. https://www.usn.no/studier/finn-studier/helse-og-sosialfag/bachelor-i-sykepleie/	Not in the first year and no access to second and third years.
VID, Bergen, Oslo https://www.vid.no/site/assets/files/19198/studieplan-for-bachelor-i-sykepleie-vid.pdf?nc=1593680226	no

Reviewing nursing research literature demonstrates that there exists a considerable concern about nurses' knowledge, competence and preparedness for a disaster or mass casualty event (Unver et al. 2018), but also that preparedness among nurses is key for positive outcomes in disasters (Brewer et al. 2020). Such a concern is also affected by the experience of disasters in the differing countries (Farra and Smith 2019). The Covid-19 outbreak took place long after the start of the present study (Section 1.1; page 6) and consequently the pandemic as such, is not part of this work, but relevant and concurring with the present work, one recent study during the Covid-19 pandemic in the USA suggests that telemedicine is important and should be learned by nurses in order to reduce home visits and potential exposure to infection (Caleb Alexander et al. 2020). Furthermore, a radical rethink about developing and integrating high-quality nursing home care into core health care services, together with advanced care planning, more formalised leadership and education is suggested based on Covid-19 experiences in nursing homes (Fallon et al. 2020). A study where Iranian nurses, with recent experiences of response to disasters, were interviewed to examine the competences required to provide better care in disaster events. The findings show that to provide disaster support effectively, nurses need more skills in technical, management, ethical and personal abilities. Therefore, there is a need for more training content in academic curricula and in nurses' service training (Baharami et al. 2014; Veenema and Woolsey 2013). Examining Nursing faculty members experience in a disaster area in Japan shows that the role of the academic institution in a disaster was unclear as was the role of the academics. Furthermore, the role of students was not clarified either. The paper suggests that it is important to clarify institutional roles in Disaster Management Plans (Kamei et al. 2019) underlining the need for nurses in Disaster Management planning. Furthermore, there is also a need for more knowledge about Disasters for Nursing educators and they are underprepared to deal with disaster situations (Öztekin et al. 2015). Several studies concluded that nurses have a lack of knowledge in disaster topics and that there is a need for more focus on disaster topics in all nursing educational programs (Kako and Mitani 2010; Yan et al. 2015; Whitty and Burnett 2009; Usher and Mayner 2011; Nilsson et al. 2016). Usher et al. (2015) investigated an action research framework by building a research course for nurse delegates from the Asia Pacific Emergency and Disaster Network (APEDNN). The aim of this course was to develop research skills for Disaster Nurses. The background is that many studies show that nurses feel inadequately prepared to deal with disasters; therefore, there is a need for research in this area (Usher et al. 2015). The effect of working in a disaster area can be quite dramatic and cause

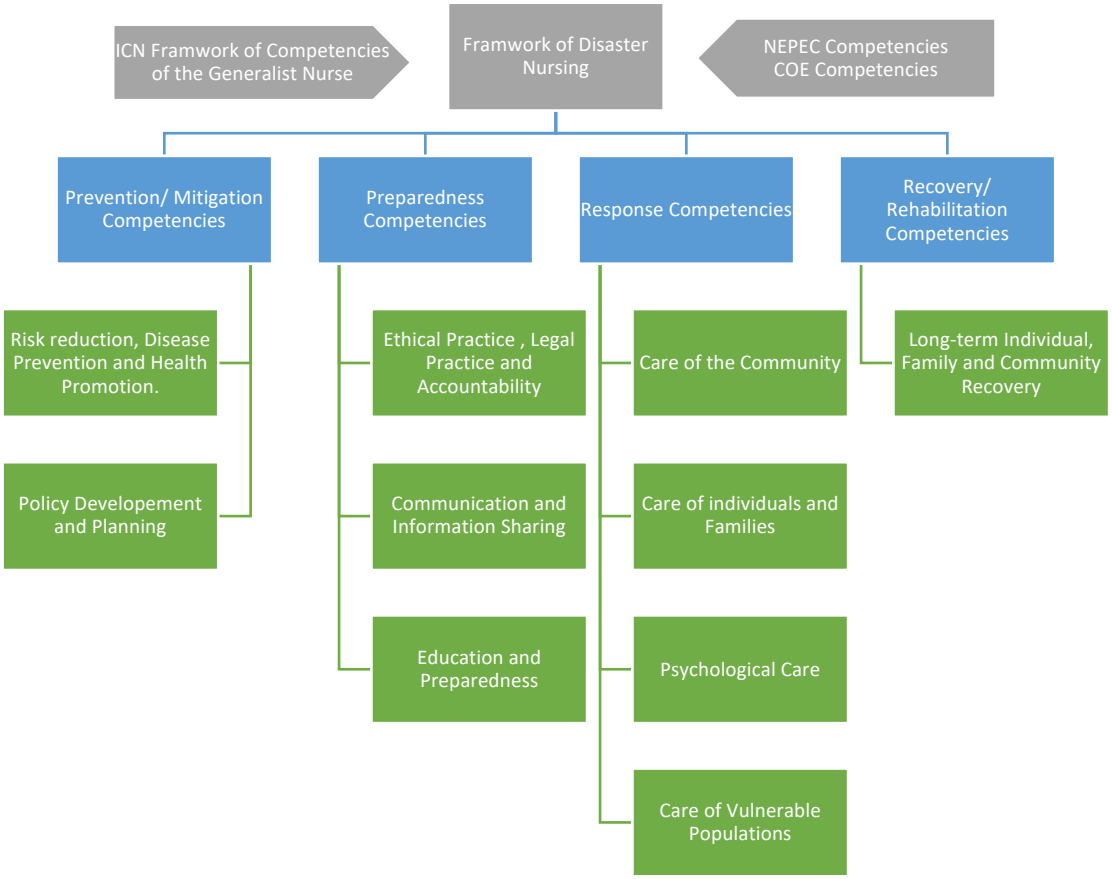
considerable mental distress, thus Hirohara et al. (2019) have a focus of the necessary factors in rebuilding a workforce of nurses in a post disaster setting. Measures such as parenting support, job opportunities and psychological support are proposed. On the other hand, it can be difficult to carry out research during a disaster (Reifsnider et al. 2014). The aim of Reifsnider et al. (2014) was to provide a lesson learned in order to help researchers consider what can go wrong with studies when a disaster strikes, challenges in the midst of natural disasters and how to proactively plan for keeping research reliable and valid (Reifsnider et al. 2014). Giarratano et al. (2014) reviewed literature to investigate if post disaster research was an opportunity for nursing research. They concluded that nurses should be prepared to use the opportunity to carry out research if a disaster strikes the community.

2.3.2 Framework for Disaster Nursing Education

Indeed, a notable additional area of literature and work on Disaster Nursing emanates directly from the realms and world of practice and is therefore evidence-based practice in terms of orientation. Key practise-based organisations have sought to develop ideas in this area – paying particular attention to issues relating to awareness of important skill-sets competence, standards, training and education. However, it should be emphasised strongly that the focus remains resolutely practice oriented, with perhaps less emphasis on determining conceptually whether Disaster Nursing will or should represent a future sub profession.

Since nurses play vital roles wherever a disaster strikes, the International Council of Nurses (ICN) and the World Health Organization (WHO) recognize the urgent need for building capacities of disaster knowledge to nurses at all levels. Therefore in 2009 the ICN and WHO developed a framework (Figure 2.6) of disaster nursing competencies (WHO and ICN 2009),

Figure 2.6 ICN Framework of Disaster Nursing Competencies



COE: Centre of Excellence; ICN, International Council of Nurses; NEPEC, Nursing Emergency Preparedness Education Coalition.
(Adapted from WHO and ICN Disaster Nursing Framework 2009)

The ICN Framework of Disaster Nursing Competence is organized with reference to the four parts of the disaster management cycle as shown by Figure 2.6. The four parts of the disaster management cycle are: Prevention/Mitigation, Preparedness, Response and Recovery. The Disaster Nursing competences were defined by ten domains: Risk Reduction, Disease Prevention and Health Promotion; Policy Development and Planning; Ethical Practice, Legal Practice and Accountability; Communication and Information Sharing; Education and Preparedness; Care of the Community; Care of Individuals and Families; Psychological Care; Care of Vulnerable Populations; and Long-term Recovery of Individuals, Families and Communities (WHO and ICN 2009).

It is suggested that the framework should be adapted for each individual country or specific circumstances. Nevertheless, it is also notable that the framework has not found

its way into influencing national practice, in Norway, the ICN Framework of Disaster Nursing (WHO and ICN 2009) has not been adapted into the nursing education framework. In a published article by this author, which reviewed and presented findings relating to Norwegian University and University College curriculums for undergraduate BSc in nursing and postgraduate/ master in nursing, it was found that Norway's nursing education framework does not include any specific references to disaster topics (Holdo et al. 2017). However, the recent revision of the undergraduate BSc in nursing and postgraduate/ master in nursing (2019) is based on guidelines rather than specific curriculum; it includes knowledge about mass casualties, crisis- and disaster situations. No new postgraduate courses for nurses based on large emergencies or disasters have been initiated since the study of Holdo et al. (2017).

In another report based on reviewing the WHO and ICN (2009) framework, Hutton et al. (2016) suggest that there is a need for more discussion related to the level of nursing education and practice competencies that should be addressed and debate if advanced skills competencies are needed only for those who respond often or are specialized (Hutton et al. 2016). This is underlined in recent research from several countries and it has been shown that more nursing research is needed to improve nurses' ability in disaster nurses' skills (Grochtdreis et al. 2016; Yamamoto 2013; Kawasaki et al. 2020). Yet interestingly, this work on skills competencies of nurses has not linked robustly to work on Disaster Nursing concepts. Therefore, this confirms from the nursing practice side as well, that more work needs to be done on defining and linking concepts and practice-based elements of Disaster Nursing competence and develop a theoretical framework for Disaster Nursing education. Investigations into core competencies required for Disaster Nursing highlight that several specific clinical skills and disaster training are needed (Yin et al. 2011; Hirohara et al. 2019). Furthermore, the same study also shows that there is need for more research into nursing skills necessary at different types of disaster sites (Yin et al. 2011). To identify the core competencies Thobaity et al. (2016) have demonstrated that it is possible to use a scale to evaluate nurses' preparedness and competencies regarding disaster and this scale can serve as basis for a curriculum (Thobaity et al. 2016). It is also recognised that leadership and branding dynamics are important topics to increase disaster nurses' status. A further paper by Thobaity et al. (2017) is a scoping review on the core competencies of disaster nursing. From a final selection of twelve papers (selected from a total of 124 eligible papers) Thobaity et al. (2017) proposed that the domains of core competencies were; understanding content and

location of the disaster plan, communication during a disaster and ethical issues as well as planning, decontamination and safety together with establishing an incident command system. Communication during a disaster also entails Disaster Nurses to be sufficiently trained so as to understand when they need to contact specialist support and be advised by experts. Regular training and disaster drill are suggested as very important and is in line with other findings of the present work. Xia et al. (2020) studied the effectiveness of a disaster preparedness nursing education program and concluded that such a program lasting 7 hours did enhance students' abilities. However, the SINCHI educational model, as described and tested by Shinchi et al. (2019) demonstrates the importance of simulation and training as an integral part of Disaster Nursing Education. Such findings are supported by the survey study in Indonesia by Setyawati et al. (2020). Simulation and training are also recommended to improve Hospital Nurses' disaster competencies (Nejadshafiee et al. 2020). In order to ascertain perceived learning needs, Wang et al. (2019) carried out a psychometric evaluation that could be used for undergraduate nursing students. A similar test was devised for evaluating the competencies of nurses in disaster response by Marin et al. (2020). Many of the papers have a general focus in terms of disaster nursing education, whilst Menegat and Witt (2019) concentrated their study on requirements for Rural Disasters caused by flood.

Overall, then Table 2.3 presents a selection of nurses' research papers that have particular relevance to the study of disaster and inform this study of Disaster Nursing practice in Norway. It demonstrates that nurses' research spans a considerable range of topics and the majority of papers can be classified as focussing on care in the widest sense (Gaire et al. 2016; Rassin et al. 2007). The papers can also be classified by their relevance to the Disaster Cycles. Furthermore, Table 2.3 indicates the degree and diversity of some studies - some are concerned with Post traumatic stress disorder (PTSD), others consider long-term effects, whilst others deal with caring for vulnerable patients such as people with handicaps, pregnant women, and children as well as caring for older and frail persons during a disaster. Yet, the diversity of this work does not mean that there is not the possibility for better integration between them and together. Topics such as dealing with victims and relatives of victims have also been included. Where the management and understanding of the nurse resource is important several papers show examples of how poor understanding has led to ineffective use of nursing personnel. Described in Section 1.1 the present study was started before the Covid-19 outbreak and consequently the pandemic will not be a focus for this work. However, a Norwegian paper (Kirkevold et

al. 2020) published during the Covid-19 pandemic highlights some of the issues related to infection control in Norwegian nursing homes. The study points out problems with availability of Personal Protective Equipment (PPE), the management of nurses, some being in part time employment at a number of institutions thus causing increased risk of the spreading of infection between nursing homes and importantly training and education of personnel to be able to plan and practise infection protection (Kirkevold et al. 2020). It is also of interest to note that some authors suggest that instead of using the current anti-epidemic response to the Covid-19 pandemic, it might be more appropriate to handle the pandemic using a disaster management approach. The phases of disaster management are also part of pandemic planning through the mitigation, preparedness, response and recovery phases. However, dependent upon the specific emergency scenario, the phases may be applied differently or adapted. In the case of the pandemic, it can be considered a biological disaster (Chan 2020, Jacobsen 2020). This proposed approach to dealing with a pandemic gives disaster nursing education even more importance and currency.

Table 2.3 Nurses studies involving nursing in disasters

Theme	Mitigation	Preparedness	Response	Recovery
Mass casualty or Disaster Simulation for nursing student 2.4		Davis et al. (2020); Unver et al. (2018); Hung et al. (2020)	Husna et al. (2020); Hung et al. (2020); Kose et al. (2020); Kim and Lee (2020); Laplante et al. (2018); Unver et al. (2018)	
Nursing students experiences from live disaster exercise 2.4			Farra and Smith (2019)	Sickora et al. (2020)
Disaster education for nursing students 2.4	Grimes et al. (2020); Alfred et al. (2015)	Alkhalaieh 2020; Grimes et al. 2020; Labrague et al. (2018); Shannon (2019); Wang et al. 2019; Xia et al. 2020; Zhang et al. (2018); Nilsson et al. (2016); Al Khalaileh et al. (2012); Alim et al. (2015); Alfred et al. (2015)	Labrague et al. (2018); Huh and Kang (2019); Xia et al. (2020); Nilsson et al. (2016); Alim et al. (2015); Alfred et al. (2015)	Sickora et al. (2020); Alfred et al. (2015)
Disaster education program for nurses 2.4	Noh et al. (2019)	Noh et al. (2019); Kawasaki et al. (2020); Kako et al. (2018); Al Khalaileh et al. (2012)	Noh et al. (2019); Kawasaki et al. (2020); Kako et al. (2018); Sonneborn et al. (2018); Maeda et al. (2018); Kirkevold et al. (2020); Pesirdis et al. (2015)	Noh et al. (2019)
Simulated disaster drill experiences among nurses 2.4		Digregorio et al. (2019); Husna et al. (2020)	Digregorio et al. (2019)	
Nurses experiences from disasters 2.4		Gray et al. (2019); Kamei et al. (2019); Veenema and Thornton (2015)	Scrymgeour et al. (2020); Gray et al. (2019); Kamei et al. (2019); Al Khalaileh et al. (2012); VanDevanter et al. (2014); Morris et al. (2016); Veenema and Thornton (2015)	Lu et al. (2020); Moradi et al. (2020); Hirohara et al. (2019); Kamei et al. (2019); Ingram et al. (2016); VanDevanter et al. (2014); Morris et al. (2016)
Nurses preparedness for disasters 2.4	Lane and McGrady (2018)	Said and Chiang (2020); Rizqillah and Suna (2018); Sonneborn et al. (2018); Noh et al. (2019); Marin et al. (2020); Brewer et al. (2020); Rokkas et al. (2014);	Sonneborn et al. (2018); Maeda et al. (2018); Lane and McGrady (2018); Setyawati et al. (2020); Marin et al. (2020); Rokkas et al. (2014); Yokoyama et al. (2014)	Yokoyama et al. (2014)

		Macleod et al. (2017); Nejadshafiee et al. (2020); Gowing et al. (2017); Al Khalaileh et al. (2012); Ahayalimudin and Osman (2016); Arbon et al. (2013)		
Patients and relatives experiences from disasters 2.4	Rehnsfeldt and Arman, (2012); Råholm et al. (2008); Roxberg et al. (2010); Kukihara et al. (2014)		Eisenmann et al. (2014)	Sato (2020); Susanti et al. 2019; Rehnsfeldt and Arman, (2012); Råholm et al. (2008); Roxberg et al. (2010); Cacchione et al. (2011); Ni et al. (2015); Gaire et al. (2016); Sveen et al. (2016); Zhang et al. (2015); Kukihara et al. (2014); Hu et al. (2016)
Managing and leadership in a disaster event 2.5		Kirkevold et al. (2020); Morioka et al. (2015)	Morris et al. 2016; Zhong et al. (2014)	Morioka et al. (2015)
Media and Technology use in disasters events 2.10	Wong et al. (2016)		Caleb Alexander et al. (2020); Owens et al. (2013); Woods et al. (2014)	Caleb Alexander et al. (2020); Hu et al. (2015); Woods et al. (2014); Hu et al. (2016)
Rural nurses experiences and roles in disasters 2.9		Kulig et al. (2014); Kulig et al. (2017); MacLeod et al. (2017)	Kulig et al. (2014); Kulig et al. (2017); Winters et al. (2014)	Kulig et al. (2014); Winters et al. (2014); MacLeod et al. (2017)

Gowing et al. (2017) conducted a literature review on disaster preparedness among health professionals and support staff. Their review claims that disaster medicine, nursing and health care are new disciplines as debated in the earliest research paper published in 2003. Consequently, it is suggested that these disciplines and related studies only gained prominence after the attacks in New York on September 11, 2001. It is, nevertheless acknowledged that disasters are not new phenomena, but it is suggested that within the health disciplines, publishing research for the improvement of preparation might be new. However, this is in contrast to the present study where papers dating back to before 2001 have been found, despite the focus of the Literature Review being based on recent research. An important paper related to Disaster Nursing is Suserud and Heljamae (1997) which was published in 1997. One should also acknowledge that the start of modern nursing was due to Florence Nightingale during the Crimean war of the 1850s. Gowing et al. (2017) whilst referencing many recent papers does not conclude on any specific preparation methods for improving disaster preparedness, whilst other work such as Shinchi et al. (2019) demonstrates that training and exercises are of vital importance. Two studies from Australia are concerned with nurses and nursing students' disaster preparedness (Brewer et al. 2020; Grimes et al. 2020). The studies show that there has been little change in the Australian undergraduate nurses' curriculum to accommodate the recommended requirements of the ICN and WHO (2009) disaster competencies and a survey of regional and rural emergency nurses identified that more education, exercises and simulations were needed especially for disaster response.

In Scandinavia a Swedish study by Nilsson et al. (2016), investigated nursing students' and registered nurses' competence in managing serious events and disasters. There was a correlation between the University/University College the nursing students had attended and their disaster nursing competence. The registered nurses who worked in emergency care reported significantly better Disaster Nursing competence than registered nurses working in other areas of health care (Nilsson et al. 2016). According to these authors, there are a number of skills and knowledge required in disaster situations, as well as, involvement from various agencies and various phases of the disaster cycle to be considered. Indeed, this adds merit to the proposed need to explore differences between training options of Disaster Nursing and Nursing for Disaster considered in this thesis. A recent Norwegian qualitative study by Evju et al. (2020) investigated the effect of outdoor training on the confidence building of nursing students. The study was based on interviews with six students who participated in "Wilderness Medicine", an

undergraduate, final year training module at the Arctic University of Norway (UiT), Narvik. It was found that such a module enhances the nursing students' confidence to meet an emergency. However, the study is rather limited and carried out by the students' demonstrators, despite this, it might show a way forward for teaching nursing students to deal with emergencies in rural sub-arctic regions. In Scandinavia, it is Sweden that appears to have the longest experience in studies of nurses' competence for disasters (Suserud and Haljamäe 1997), but even here, it has recently been argued that nurses require better training and education in the disaster area (Nilsson et al. 2016). There are still numerous nursing programs that require a deeper embellishment of disaster nursing topics.

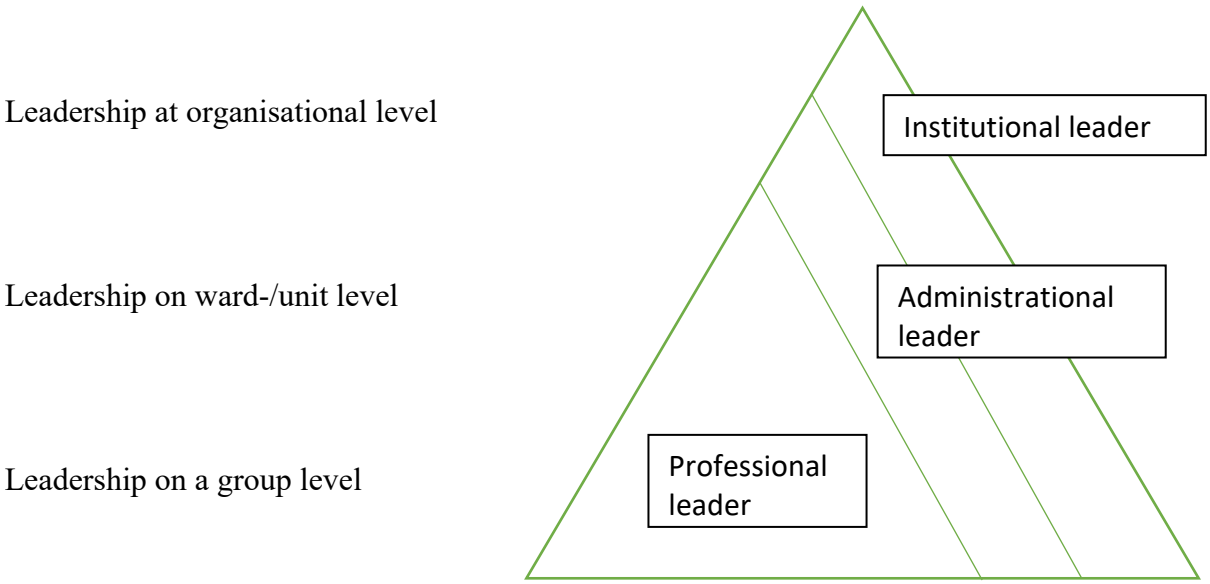
Nevertheless, the review also confirms that Norwegian and Scandinavian studies in Disaster Nursing practice are few and far between. A main interest of the studies has been to investigate personal factors concerned with victims' suffering and loss in disasters (Roxberg et al. 2010) whilst (Rehnsfeldt and Arman 2012) studied the long-term effects of disasters on the relational aspects of survivors from the 2004 Tsunami disaster. However, the article by Svensson et al. (2016) is more of direct interest as it deals with home healthcare nurses' experience on stand-by as first responders. Indeed, to date there seem to be no notable works on Disaster Nursing education in Norway and thus paving the way for this proposed thesis to make an active contribution to knowledge on the subject. In fact, where they exist at all, there are comparatively few studies emanating from Europe in general (see Grochtdreis et al. 2016) so there will hopefully be major possibilities for wider dissemination when the proposed thesis is completed.

2.4 Leadership Roles of Nurses.

Nursing as a study even at BSc level includes Management and Leadership as subject areas. Florence Nightingale's (1820-1920) important work for carving out the nurses' profession and her leadership of 38 nurses during the Crimean war (Snowden 2010, p. 4) show that leading the work is one of the nurses' main roles. Indeed, nurses have many and different roles that they are expected to fulfil as part of their professional duties. There are expectations from patients and their relatives that nurses are able to organise nurses and other health care workers work (Orvik 2011, p. 15). Even if nurses have several work tasks on a daily basis, their main obligation is to ensure the best quality of health care to patients. In other words, nurses are the glue in the health organisation that enables the

health organisation to function according to Benner (1984, p. 136). Conversely, leadership is something nurses have to perform at some level every day as discussed in Section 1.4 and also based on the work of Orvik (2011) and demonstrated by Figure 1.3. Firstly, nurses have a profession leading responsibility as a part of their authorisation, they could also have a leading role as a part of their position as for example the leader of a unit, head nurse or head of department (Orvik 2011, p.99). Orvik (2011, p. 99) argues that the three types of nurses' leadership are building on each other and we can see this in both profession, administrative and institutional leadership as demonstrated by Figure 2.7.

Figure 2.7 Nurses' three leadership roles; professional, administrative and institutional.



(Based on Orvik, Figure 4.3, 2011, p.99)

This leads us to the complexity of organisational demands that the nurses need to have in both professional and leading competencies (Benner 1984, p. 145-147; Benner 2015). Orvik (2011, p. 15) divide the organisational demands into seven themes.

There has so far been a lack of interconnectivity between the literature dealing with the leadership roles of Nurses and even Disaster Nurses. This lack of interconnectivity needs to be addressed and considered, especially to improve and to further and develop future educational provisions. Despite the fact that the nursing profession has been a part of leadership in the health care system for many years, their leading competences have still not been recognised, in order to carry out leadership in disaster preparedness and response (Veenema et al. 2016). Consequently, to improve nurses as leaders in disaster

management there is a need for more research (Veenema et al. 2016). This is supported by a Norwegian report by Nordlandsforskning (2013), where the findings highlighted the need for a better framework and outlining the length of the 'following-up' process, resourcing requirements and availability and access of competent staff, trained in leading this work in the aftermath of a disaster (Nordlandsforskning 2013; Lereim et al. 2012).

2.5 Organisation in Norway during Disasters and Emergencies

In Norway, it is the Ministry of Justice and Public Security that on behalf of the government issues reports about organisation during disasters and emergencies.[19] Furthermore, each of the Norwegian counties is administrated by a county council which is responsible for county affairs and a county governor there to implement the decisions taken by the Parliament (Storting) and the Government. The responsible Government Ministry is the Ministry of Local Government and Modernisation which has the overall responsibility for the conduct of elections and for matters relating to all local government and local democracy.[20] The municipalities in Norway that are led by an elected board are clearly important in emergencies and disasters due to the broad range of political responsibilities for providing local services to the population that they have.

Centrally, the Norwegian Directorate for Civil Protection (DSB) is the primary Norwegian government support organisation dealing with regulations related to disasters and emergencies.[21] The directorate reports to the Ministry of Justice and Public Security plans and its responsibilities cover local, regional and national preparedness and emergency planning, fire safety, electrical safety, handling and transport of hazardous substances, as well as, product and consumer safety. It also conducts exercises in crisis management and communication for strategic management at national, regional and local levels and thus their involvement of and view of nurses is clearly important. The county governors` emergency preparedness and response work are also followed up by the DSB and is responsible for the professional and administrative follow up of the Norwegian Civil Defence, the Emergency planning college, the Norwegian Fire academy and the civil defence`s three regional schools.

[19] https://www.regjeringen.no/en/dep/jd/organisation/id487/
[20] https://www.regjeringen.no/en/dep/kmd/id504/
[21] https://www.dsb.no/menyartikler/english/

An operative part of the DSB is the civil defence organisation being in charge of the education and training of the civil defence forces.[22]

At local level, the municipalities are responsible for key social services ensuring the continuation of these services during emergencies. This applies to local infrastructure, health services, care for the elderly and information to the public. The municipalities have primary responsibility to tackle any peacetime emergency. Important tools in this respect are risk and vulnerability assessments and establishing local crisis management plans whilst the police are tasked with securing people, property, order and public safety. They are responsible for handling accidents and incidents, where life and health are at risk as well as ensuring measures to avert danger and mitigate the consequences. All the municipalities are furthermore required to have a fire service, and this is the municipality`s primary resource for handling both fires and other types of emergency. Additionally, the municipalities are importantly required by law to undertake civil emergency preparations for the health sector.[23]

The collective search and rescue (SAR) management at the two rescue coordination centres are located in Bodø in the north and Stavanger in the south. The rescue sub centres lead and coordinate search and rescue operations within their local respective areas and consist of representatives from a number of government agencies, who (together with the local chief of police, who is in overall command) lead and coordinate search and rescue operations within their respective areas.[24]

There is no overall legislation concerning civil protection in peacetime. Many government agencies and private organisations do, however, have civil protection tasks and are responsible for civil emergency planning and each part of the administration must ensure that the necessary detailed emergency plans are put into effect. This is mainly regulated through laws and regulations concerning specific sectors.

The DSB issues reports on a yearly basis concerning “National Risk Analysis and Codes of Practise”. The latest version of this report was issued in June 2020 and importantly it documents the percentage of local municipalities that have completed the disaster

[22] https://digitalprofil.dsb.no/tema/sivilforsvaret-no
[23] https://www.regjeringen.no/en/topics/health-and-care/municipal-health-and-care-services-/id10903/
[24] https://www.hovedredningssentralen.no/english/

preparedness plans.[25] The data from this report shows that 95% of the municipalities answer positively that they have a municipal disaster preparedness plan, whilst only 75% replied that the plan was based on their required risk and vulnerability analysis. Furthermore, only 57% of all the municipalities fulfilled all the requirements that the DSB had published for a disaster preparedness plan. In terms of carrying out exercises based on the plan, 88 % of the municipalities gave a positive answer that exercises based on the plan had been carried out during the last two years. In terms of progress in the municipal preparedness, the 2020 DSB report shows that whilst there has been a steady improvement during the last 6 years, a peak was reached in 2017 with present result (2020) being two percent lower than the 2017 result.

DSB have for the first time in 2019, investigated the status of health preparedness plans in the municipalities. The results show that 82% of the replies indicate that the municipalities have developed a health preparedness plan, whilst only 40% reply that exercises based on the plan have been carried out. However, 30% of the municipalities reply that no exercise based on the plan have been carried out and a further 30% reply that they don't know if an exercise based on the plan have been carried out. Clearly, health preparedness has not been the most pressing concern among the municipal governors, whilst overall disaster preparedness has been more of a consideration. Unfortunately, joined up thinking between disaster preparedness and health preparedness does not appear to be present, but that might be an important concern not only for the municipalities. The formulation of the DSB requirements of the municipalities could be altered in order to achieve an improved correlation between disaster preparedness and health preparedness.[26]

The DSB also carries out research, studies and consequent documentation related to the national vulnerability and changing threat scenario as a basis for planning emergency preparedness, response and priorities. The main legislations related to emergencies and disaster management are given below.

- The Fire Protection Act of 8th December 2000, implemented 1st January 2001
- The Fire and Explosion Prevention Act of 14th June 2002

[25] https://www.dsb.no/globalassets/dokumenter/rapporter/dsb-arsrapport-2019.pdf
[26] https://www.dsb.no/globalassets/dokumenter/rapporter/dsb-arsrapport-2020.pdf

- The Planning of Building`s Act of 14th June 1985, amended 24th November 2000
- The Protection Against Pollution Act of 13th March 1981
- The Regulation of 4th July 1980 on the Main Principles of the Organisation of the Search and Rescue Services
- The Municipal Responsibility for Sectorial Risk, Vulnerability Assessment and Emergency Plan; Implemented 1st January 2010

However, none of the above mention Nurses specifically, as a profession or as part of organisations. This suggests that the work nurses do is not well communicated to government organisations or that the organisations with responsibilities for the above legislation expect the nurses to be found in other organisations. Consequently, cooperation between the differing departments and organisations is essential. Regardless of the scenario, the views and representation of nurses should feature more strongly than what is presently the situation in Norway.

2.6 Reorganisation of the Norwegian Health Service and Police

The Norwegian coordination reform[27] was implemented in 2012 and has had a significant effect on the functioning of the Norwegian Health Service. This has also an effect of both nurses' work, responsibilities and organisation. The main motivation of the reform was to transfer primary health care services to the municipalities and in this way to expand local health care services. From 2012 to 2014, under the municipal co-financing regime, municipalities were obliged to cover 20% of the costs of health services provided at the specialist (hospital) level. Importantly, use of rehabilitation services in private institutions was not part of the cost-sharing mechanism of municipal co-financing. Rehabilitation services may be seen as quite similar in nature whether they be provided by municipalities, hospitals or private institutions. Thus, with rehabilitation patients readily "transferrable" between levels, the question is whether the reform brought with it a sought-after shift towards *more* municipal rehabilitation and *less* specialist rehabilitation. The results do not suggest any general expansion of municipal rehabilitation services and the results of the analyses suggest that municipalities shift *away* from the use of specialist rehabilitation services and *towards* the use of rehabilitation services in private institutions since the latter becomes relatively cheaper (free-of charge) than both municipal and

[27] https://www.regjeringen.no/en/dokumenter/report.no.-47-to-the-storting-2008-2009/id567201/

specialist services in post-reform periods (as specialist services come at a cost to municipalities post-reform). While the main goal of the reform has not materialized the results nevertheless suggest that incentives (of cost-shifting) do play a significant role in rehabilitation service use. [28]

Importantly for the present study, the reform has also resulted in that nurses are in charge of municipal nursing home and that they also have a much larger responsibility in terms of home care duties. Whilst this may not have been the main intention of the reform, nevertheless the result is that nurses working in the municipalities have been given substantial additional duties. This gives even more currency to the present study because one further consequence in many rural areas is that after the reform, it is nurses who are the most medically qualified staff that inhabitants can get in touch with at short notice. The consequences for overall disaster management planning and especially for municipal preparedness planning as well as contingency planning for the rural municipalities are clearly considerable.

The reform has obviously now a possibly unintentional effect on the nurses' place in a disaster or an emergency since they do not appear to have a position in disaster management planning boards whether at municipal or county level. Nevertheless because of the nurses' position now in rural areas as the most qualified medical staff, it is essential that they should be part of disaster management planning and preparedness planning boards. At present, it does not appear to have been taken into account and it seems unlikely it was considered when the coordination reform was planned and implemented.

In addition, the police are being reorganised in a manner similar to the coordination reform of the health service and it will have a significant effect on the functioning of the Norwegian police. A large reform of this type is also likely to have an effect on the functioning of the police in an emergency and in a disaster.

2.7 Relevant International Documents related to Disaster Management and Emergency Nursing

This part of the literature study is based on the documentation of rules and regulations related to disaster management and emergency nursing such as WHO and ICN (2009)

[28] https://www.regjeringen.no/en/dokumenter/meld.-st.-26-20142015/id2409890/

documented proposals. Nurses play vital roles wherever a disaster strikes, consequently the two international organisations ICN and WHO developed the framework as shown in Figure 2.6 of disaster nursing competencies.

One significant comparatively recent international document is the Sendai Framework for Disaster Risk Reduction 2015–2030 (2015) (SFDRR). It is the first global policy framework of the United Nations' post-2015 agenda and it represents a direction of global policy coherence including explicit reference to health, development, and climate change. The report points out that between the years 2000 and 2012, it is estimated that over 700,000 people lost their lives; and more than 1.5 billion people were affected by disasters in various ways. Furthermore, it was estimated that the total economic loss exceeded USD 1.3 trillion over the period 2000-2012 (UNISDR 2013a).

The SFDRR is meant to reflect our understanding of the complexity of disaster risk in our century. It calls for closer collaboration among all sectors including the health sector. However, whilst the SFDRR has a focus on health, the framework for disaster nurse competencies is not mentioned or referred to either in terms of required staff competencies or the position that nurses should have in a disaster team. Progress in disaster risk reduction (DRR) research has shown that it is often not the hazard that determines a disaster, but the vulnerability, exposure, and ability of the population to anticipate, respond to, and recover from its effects. The framework aims to achieve a reduction of disaster risk and consequent losses in lives, health and in the economic and environmental assets of countries. Voluntary commitments with a specific health focus have been agreed. The framework sets four priorities for action which are (UNISDR, 2015, p14);

- Understanding disaster risk;
- Strengthening disaster risk governance to manage disaster risk;
- Investing in disaster risk reduction for resilience;
- Enhancing disaster preparedness for effective response,

and to "Build Back Better" in recovery, rehabilitation and reconstruction. There is a strong focus on health in disasters and specifically health needs in disasters. Importantly, health is not specifically mentioned in the four priorities for action, however, health is clearly stated in the aim for achievement over the 15 years from 2015 to 2030:

"The substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries" (UNISDR, 2015, p12).

Furthermore, health is also part of the guiding principles of the Sendai Framework as stated on page 10 of the Sendai Framework document under III. Guiding principles:

"Managing the risk of disasters is aimed at protecting persons and their property, health, livelihoods and productive assets, as well as cultural and environmental assets, while promoting and protecting all human rights, including the right to development" (UNISDR, 2015, p10).

The report focuses largely on urban regions, for example initiatives such as "One million safe schools and hospitals" initiative; the "Making Cities Resilient: My city is getting ready" are clearly focused on urban areas, whilst it is clear that rural regions have differing challenges and the report does not specifically focus on the tasks of the emergency and disaster personnel (UNISDR 2015, p16).

A study based on the Sendai Framework by Aitsi-Selmi et al. (2015) considers the commitment to people's resilience, health and well-being. The study points out that whilst there is an earlier reference to health in the Hyogo Framework for Action (UNISDR 2005) to promote the goal that hospitals should be safe from disasters, it overlooks the wider societal determinants of health and well-being. The effect of disaster on seriously ill patients has been studied by Sato (2020) who points out the additional provisions required in order to cater for such patients. The Hyogo Framework for Action helped to widen the remit of Disaster Risk Reduction activities, but challenges remained. Aiti-Selmi et al. (2015) also points out that the expansion of DRR to include risk assessment related to vulnerability and exposure has been compared to the widening of health activities to include prevention which has often been part of public health only. At present public health is increasingly concerned with the total health system.

In Norway with the introduction of the Norwegian coordination reform it is ensured that primary health care services are transferred to the municipalities and in this way expanding local health care services. However, it is discussed in the SFDRR, that it is important to upgrade preparation and training of health workers on preparedness plans. A further important paper is that of Phibbs et al. (2016) which considers seven key concepts that resonate with contemporary public health practice. These are also drawn attention to by (UNISDR 2015) as well as Chan and Murray (2017). The concepts are: the social determinants of health; inequality and inequity; the inverse care law;

community-based and community development approaches; hard to reach communities and services; the prevention paradox; and the inverse prevention law. Lo et al. (2017) suggests that Health Emergency and Disaster Risk Management (Health-EDRM) have emerged as an umbrella field that encompasses emergency and disaster medicine, DRR, humanitarian response, community health resilience, and health systems resilience. This is a different approach to that of standard public health emergency management in that all hazards are considered.

However, a focus on emergency and disaster personnel has been given by World Association for Disaster and Emergency Medicine (WADEM). WADEM is the oldest international emergency and disaster medical organization with members from 55 countries. The organisation addresses all staff involved in Disasters and Emergencies. The WADEM has a special Nursing Section which addresses challenges that nurses experience when involved in disasters. WADEM is considered a competent organisation and has been invited to perform a review of the International Council of Nurses' (ICN) Disaster Competencies as set out in the WHO and ICN framework for Disaster Nursing (WHO and ICN 2009). Despite this, the proposed mission of the Nursing Special Interest Group (SIG) of WADEM is to foster collaboration among nurses involved in research, education, management, and practice in prehospital, emergency, public health, and/or disaster health care. There is no joined up approach or thinking about disasters between the professions that forms WADEM's Special Interest Groups (SIGs) that deal with disasters and disaster nursing even for an apparent umbrella organisation such as WADEM.[29]

2.8 Rural Communities and sparsely Populated Sub-arctic Areas

There are several gaps in disaster related research such as research on specific factors with rural living and environmental threats related to psychological distress (Whitehead and Arbon 2010). Evaluating community cooperation and improving community preparedness, and more clinical research to identify gaps in the current international disaster management knowledge base is necessary. Lack in research data regarding the outcome of disaster education for nurses, and outcomes of disaster preparedness and response exercises for nurses need to be documented. Most research in the disaster health

[29] https://wadem.org/sigs/nursing/

field is conducted either in the pre-event or recovery phases (Whitehead and Arbon 2010), Kapucu and Kosa (2013). Davis et al. (2010) points out that rural areas often have health service disparities and are therefore more vulnerable than their urban counterparts. Rokkas et al. (2014) studied the issues facing disaster nursing in Australia with a focus on the nurses working within the rural population rather than the hospital centric work force and found that their disaster preparedness was carried out on an ad hoc basis. A study by Kulig et al. (2014) concludes that many rural nurses in northern Canada may not have possessed the required education for disaster care. Based on data from the national profile of regulated nurses, the study demonstrated however that nurses play a significant role in responding to disasters. One of the conclusions of the study is that there is a strong need to differentiate between urban and rural environments when developing programs for Disaster Nursing Competencies. It is claimed that such differentiation would also benefit nurses and nursing practise in locations that are significant, but large distances away from advanced referral centres both in distance and travel time. A study by Chan and Murray (2017) demonstrates that rural areas in Asia are heavily impacted by natural disasters and have different health care needs compared with urban areas. Chan and Murray (2017) also refers to the higher age of people living in Asian rural areas thus requiring different health care. The paper also points out the lack of journal papers (only 9 at the time of writing this thesis) that used the term rural health emergency and disaster risk management (health-EDRM) which reflects the research gap and that health-EDRM is still in its infancy as a research topic as only three studies found were on rural health.

Evaluating community cooperation and improving community preparedness, and more clinical research to identify gaps in the current international disaster management knowledge base is necessary. Lack in research data regarding the outcome of disaster education for nurses, and outcomes of disaster preparedness and response exercises for nurses also need to be documented. An earlier study by Edwards et al. (2008) documents and points out that rural hospitals in the USA face many challenges both due to industrial and natural disasters, but achieve excellence in responding with limited resources. Edwards et al. (2008) thus conclude that rural preparedness has national value greater than to the apparent population served.

2.9 Media and Technology

Social media and new technology have transformed classical media and reporting from and about accidents and disasters. The use of social media with photographic and video capabilities of smart phones has been criticised and has brought many new ethical and psycho-social issues. Media such as radio, television, internet and smart phones with social media are on the other hand important tools for spreading information to endangered populations about impending disasters. However, such powerful tools must be used with caution so as not to cause panic instead of calm response. Whilst journalists may be told to "toe the line", it is much more challenging to control input from hundreds if not to say thousands of smart phones to various parts of the social media. Indeed, this new technology can be used in very positive ways such as to locate and map potential danger, but if the input overtly focuses on the worst-case scenario, it could cause considerable and overwhelming fear and panic (Woods et al. 2014). Nurses and other first responders would be those who have to deal with such issues in addition to the disaster itself. Therefore, it is important that there are plans and strategies in the community for government, community leaders and public health professionals on how to use media to give information to inhabitants of the community in all phases of a disaster event. Nurses should be involved in these plans as they need to know and determine what kind of information people in the community obtain, in order to give effective help during and in the aftermath of a disaster. The lack of nurses' involvement in local disaster management plans in Norway was revealed by the authors' review of all the Norwegian plans local disaster management (Holdo et al. 2017). With this in mind and specifically since Norway has many rural communities where nurses may be the only health care workers when a disaster strikes, it is important that they are involved in such plans.

Technology could be useful in all phases of a disaster, such as tracing signals from victims' mobile phones, use of drones to find stranded people, but also the use of modern "Portable Health Clinics" (PHC) can be of considerable benefit (Hu et al. 2015). A study by Hu et al. (2015) suggested that to improve post disaster management of victims' health, low cost PHCs with medical sensors and Skype, Zoom or Teams type consultations with remote doctors could be of considerable help. Recently, it has been demonstrated that telemedicine is important and should be learned by nurses in order to reduce home visits and potential exposure to infection (Caleb Alexander et al. 2020). However, during such circumstances it would be the nurses who were the front-line health care professionals

and first responders able to handle such equipment. In the remote parts of Norway such a set-up could be very valuable indeed, but would require specific training of nurses.

2.10 How do Disaster Management Studies in Health Care involve Nursing?

Disaster management studies do not clearly distinguish between health care workers and nurses or medical practitioners which is a weakness in their analysis. In very much a similar manner, Public health emergency management (PHEM) studies and journal papers (Rose et al. 2017; Nelson et al. 2007) discuss health care workers without differentiating the very diverse roles that they fulfil or indeed the skills and experience that are necessary and available if disasters strike. When nurses are considered as a group, it is either in terms of a psychological setting or an educational setting. An example is the study by Benedek et al. (2007) which focuses on health care workers in the rescue and recovery phase of a disaster when they have a risk of developing mental health problems. Psychologists have been interested in solving this problem and some of the public health research has involved nurses to study their experience from disasters. A study by Johal and Mounsey (2015) focused on how the Canterbury earthquakes (New Zealand) led to a re-affirmation of values of how nurses identify positive aspects from their experience. Another article from the same study highlights ways which organisations can support employees following disasters (Mounsey et al. 2016). In Scandinavia, Jonson et al. (2017) studied how head nurses at emergency departments perform an effective disaster response by using a computer-based simulation training program, whilst in the UK, Sully (2016) focused on group dynamics related to disaster teams. Most of the research in disaster topics in Norway has been carried out by the Norwegian Centre for Violence and Traumatic Stress Studies (INKVTS), their main attention has been on the effects on relatives and victims from disasters (Wiström et al. 2016; Stene and Dyb 2016; Haga et al. 2015; Haga et al. 2017; Hafstad et al. 2012).

Nevertheless, the present search has not found evidence that disaster management studies have taken into account nursing in disasters, the role of nurses or their function in a disaster; the focus has rather been on health emergency management and disaster teams. Comparatively recent public health emergency management (PHEM) papers (Rose et al. 2017) connected with PHEM as a field of practise do not discuss the nurses' function, experience or preparation for a disaster, or relate, discuss or refer to the Association of

Public Health Nurses position paper on their role in disasters (Stanley et al. 2014). In a similar manner, a paper by Khan et al. (2018) reports on a Structured Interview Matrix facilitation technique applied to six focus groups across Canada. The focus group participants, a total of 130 participants were practitioners from public health and related sectors, and all from managerial roles. Notwithstanding, the study presents a framework or Resilience Framework for Public Health Emergency Preparedness. This framework does mention that well-trained and knowledgeable people constitute crucial social infrastructure for the system, but does not specify who these well-trained and knowledgeable people are or what function they would have in a disaster response phase. In a sense, this establishes that nurses have been taken for granted instead of being consulted by Disaster Management, Public Health Managers and leaders.[30]

2.11 Summary

It is frequently suggested that there is a considerable distance between Disaster Nursing and Disaster management – both in terms of theoretical and practical linkages. The literature that has been surveyed shows and demonstrates that Disaster management does not have a proper understanding of nursing and that nurses are not included and possibly not consulted when putting together Disaster management teams. A large percent of the studies that have been reviewed, propose that training, simulation and exercises are essential for the education of disaster nurses. The fact that the studies also demonstrate a general lack of such efforts could be due to nurses not being part of the teams devising the Disaster management plans. This appears to be the case both nationally in Norway, and internationally through frameworks organised by the United Nations such as the Sendai Framework for Disaster Risk Reduction (2015).

The converse is also true. In order to ensure effective and robust Disaster management plans, it is important that nursing and nurses should be included. Nurses represent the largest group of health care workers and it is unfortunate that the Disaster managers do not understand the role nurses play in a disaster. As a result of this they do not take a holistic view in their analysis. Clearly, such a lack of understanding is a stumbling block for effective Disaster management.

[30] https://wadem.org/sigs/nursing/

Looking to the future it is quite clear that there is a need for integrating Disaster management with nursing. This will give nurses Disaster management training and Disaster managers a better understanding of the skills that nurses have in order to build disaster preparedness for the future (Miles 2016).

Chapter 3

Research Approach and Concepts

3.0 Introduction

This chapter sets out to outline the definitions, concepts and nursing experiences that are central to answer the research question and objectives of this study. This chapter develops the twin concepts of Disaster Nursing (DN) and Nursing in Disaster (ND) as two parallel, yet inter-related conceptual typologies that can inform community nursing perspectives and practice towards disasters. Moreover, such a conceptual typology may also help focus educational standards and provision and ultimately help to address questions of regular updating of nurses to support their local communities in relation to disasters. When nurses respond to a disaster, they must provide care both for the duration of the disaster and in the aftermath.[31]

Chapter 2 has revealed that several studies prevalent in the relevant literature emphasise that nurses should actively participate in disaster preparedness and response planning (Veenema et al. 2016; Farra and Smith 2019; Grochtdreis et al. 2016). This is especially important because they often have a very close relationship and 'know' the community and are often familiar with the challenges that they will have in a disaster event. This is especially relevant when it comes to home care nurses whose role require them to have considerable local knowledge and they might also have to deliver patient care in settings without proper equipment, supplies and support staff. They may also play a role across all aspects of the disaster management cycle (see Chapter 1). The responsibilities of these kinds of nurses can be extensive during a disaster since they will often be at the forefront of interacting with local communities and individuals. Nevertheless, these interactive and 'frontline' roles and relationships may also mean that they also try to address the requirements of victims in the aftermath of the disaster. The latter has been particularly visible in recent disasters and reported in studies (Kamei et al. 2019; Brewer et al. 2020).

Chapter 2 also showed that presently there is a no consensus around a clear definition of Disaster Nursing (DN) nor a specific definition for Nursing in Disaster (ND). Indeed, one of the central contributions of this thesis will be to further consider the differences

[31] Notable literature that has a specific focus on Disasters and Disaster Nursing is Powers and Daily (2010) together with Veenema (2013).

between education and requirements of roles of nurses in terms of Disaster Nursing when compared to Nursing in Disaster (see Chapter 1). In particular, the chapter seeks to offer a conceptual framework that establishes a typology of what these two domains or fields may require at a conceptual level in the context of community/home care nurses. Indeed, this conceptual framework is able to examine this more specifically by drawing in part from literature that has frequently focused on the specific type of skills and practical competencies that may be required by nurses in a disaster. Equally there have been some limited and somewhat isolated investigations into core competencies required for Disaster Nursing – that highlight that a range of specific clinical skills together with disaster training are needed (Yin et al. 2011; Hirohara et al. 2019). Yet what this thesis argues is that to date these often self-contained and case study specific investigations and discussions have focused on particular skills and limited practical application. The literature has so far and to a large degree failed to necessarily point directly towards an overall definition and concepts and how these discussions of nursing skills should be mapped against them.

This thesis therefore seeks to develop the twin concepts of Disaster Nursing and Nursing in Disaster as two parallel, yet inter-related conceptual typologies that can inform community nursing perspectives and practice towards disasters. Moreover, such a conceptual typology may also help inform educational standards and provision and ultimately help to address questions of regular updating of nurses to support their local communities in relations to disasters. As Chapter 2 discussed, the literature already acknowledges that there is a growing need for regular training, simulation and exercises, both as part of the education of nurses that might serve in a disaster and as in relation to the continuous updating of these nurses more generally (MacLeod et al. 2017; Kawasaki et al. 2020).

This chapter will now move on to outlining the key definitions and concepts before eventually presenting a conceptual framework that seeks to identify, categorise and establish benchmarks for considering similarities and differences in the requirements for Disaster Nursing and Nursing in Disasters. By doing this, it can be more easily established how the complexities for nursing staff members when working in a disaster as well inform the specific education that may facilitate their participation in handling disaster situations. Furthermore, the conceptual framework can then further inform the desired training and educational background together with relevant exercises that nurses should aspire to have when meeting the demands of a disaster as well as the likely respective roles, membership

and positions that nurses can contribute to any Disaster Management team that are needed.

3.1 Definitions

The central research question of this study is to critically evaluate the present and future requirements of Disaster Nursing/Nursing in Disaster using rural Norway as a case study. This research question gives rise to the objectives of the study of which one is the development of a disaster nursing conceptual framework using rural Norway as a case study. Furthermore, another important objective is to examine if there is a need for disaster nursing to be regarded as a specialist sub field (Disaster Nursing) in Norway that requires dedicated and distinctively trained nurses or whether it should be viewed as simply just the application of nursing as usual but with some limited recognition of general nurses operating in a different environment (Nursing in Disaster). Consequently, part of the research approach must be to obtain clear definitions and frameworks for Disaster Nursing and Nursing in Disaster. These definitions are necessary and essential in order to achieve the aim and objectives of the study.

At present there is no agreed and consequently no clear definition of a Disaster Nurse (DN). Never-the-less a starting point to obtain this, can be the definition of the goal of Disaster Nursing which as expressed by Powers (2010, p. 3) is:

"The goal of Disaster Nursing is ensuring that the highest achievable level of care is delivered through identifying, advocating, and caring for all impacted populations throughout all phases of a disaster event, including active participation in all levels of disaster planning and preparedness."

According to this definition by Powers, in order to achieve the highest achievable level of care there may be a need to recognise the existence of tailored, distinctive, even specialist and specific skill sets that will allow the respective disaster nurses to achieve the maximum delivery of care and meet any nuances that are required to manage different parts of the disaster management cycle. According to this logic, DN assumes that disasters require a specific and specialist skill set to achieve the highest achievable level of care.

This above definition related to Disaster Nursing (DN) can be compared to the goal of Nursing which was outlined by ICN (2002) that could be said to underpin and equate

more closely to the second category of Nursing in Disaster (ND). The ICN (2002) definition of the goal of nursing is expressed as follows:

"Nursing encompasses all collaborative care of individuals of all ages, families, groups and communities, sick or well, and in all settings. Nursing includes the promotion of health, prevention of illness, and the care of ill, disabled and dying people. Advocacy, promotion of safe environment, research, participation in shaping health policy and in patient and health systems management, and education are also key nursing roles" (ICN 2002).

In this way, Nursing in Disaster (ND) is simply the application of existing general nursing skills to the distinctive setting and environment of a disaster. Under this logic, the skills of general nurses will be sufficient and/or can be readily adapted as part of their general training with a little updating to meet the demands of handling disasters.

These two defined goals can be compared with each other in order to differentiate and highlight implications for potential definitions of Disaster Nursing (DN) and Nursing in Disaster (ND). The latter ND definition can be directly associated with nursing in a disaster since it is assumed within this definition that the education, vocation and skills of nurses should be comprehensive enough to meet all collaborative care requirements regardless of the challenge and to contribute to shaping all aspects of health policy and systems. From this perspective, Nursing in disaster (ND) should - and are at present likely to - be carried out by ordinary graduate nurses (registered nurses) without necessarily any additional specialist education. And indeed, if any is forthcoming, then this should be part of a sub-field built into the general education, training and updating of nurses so they can meet all aspects of the job.

A major difference between the two definitions is the final part of the first DN definition which demands active participation at all levels of disaster planning and preparedness. This proposes that Disaster Nursing must include management and leadership and consequently it follows that the Disaster Nurse must hold a significant position within a Disaster management and Disaster planning team.

Powers (2010, p 4) proposes that there are a number of qualities that are essential for Disaster Nursing (DN). These qualities can be set out in a tabular form as in Table 3.1 in order to differentiate between a Disaster Nurse (DN) and Nursing in a Disaster (ND).

CHARACTERISTIC	**DISASTER NURSE (DN)**	**NURSING IN DISASTER (ND)**
Critical thinking	Essential	Essential
Problem solving	Essential	Essential
Adaptability	Essential	Essential
Creativity	Essential	Essential
Flexibility	Essential	Desirable
Disaster Knowledge	Essential	Desirable
Skills	Essential	Essential
Leadership	Essential	Desirable
Teamwork	Essential	Essential

Table 3.1 Comparison of the Characteristics of Disaster Nurse (DN) and Nursing in a Disaster (ND).

Based on the table and the goal of Disaster Nursing, the Disaster Nurse can be defined in the following way:

The Disaster Nurse must have the overall responsibility for nursing care delivery during a disaster to ensure that the highest achievable level of care is delivered in all phases of a disaster. The Disaster Nurse must also implement and preserve nursing care within Disaster Management. Nursing care is also an important part of Disaster Resilience and the Disaster Nurse should ensure that this is part of the Disaster Management agenda.

Table 3.1 and the Disaster Nursing (DN) definition give the impetus for the definition of Nursing in Disasters (ND) in the following manner:

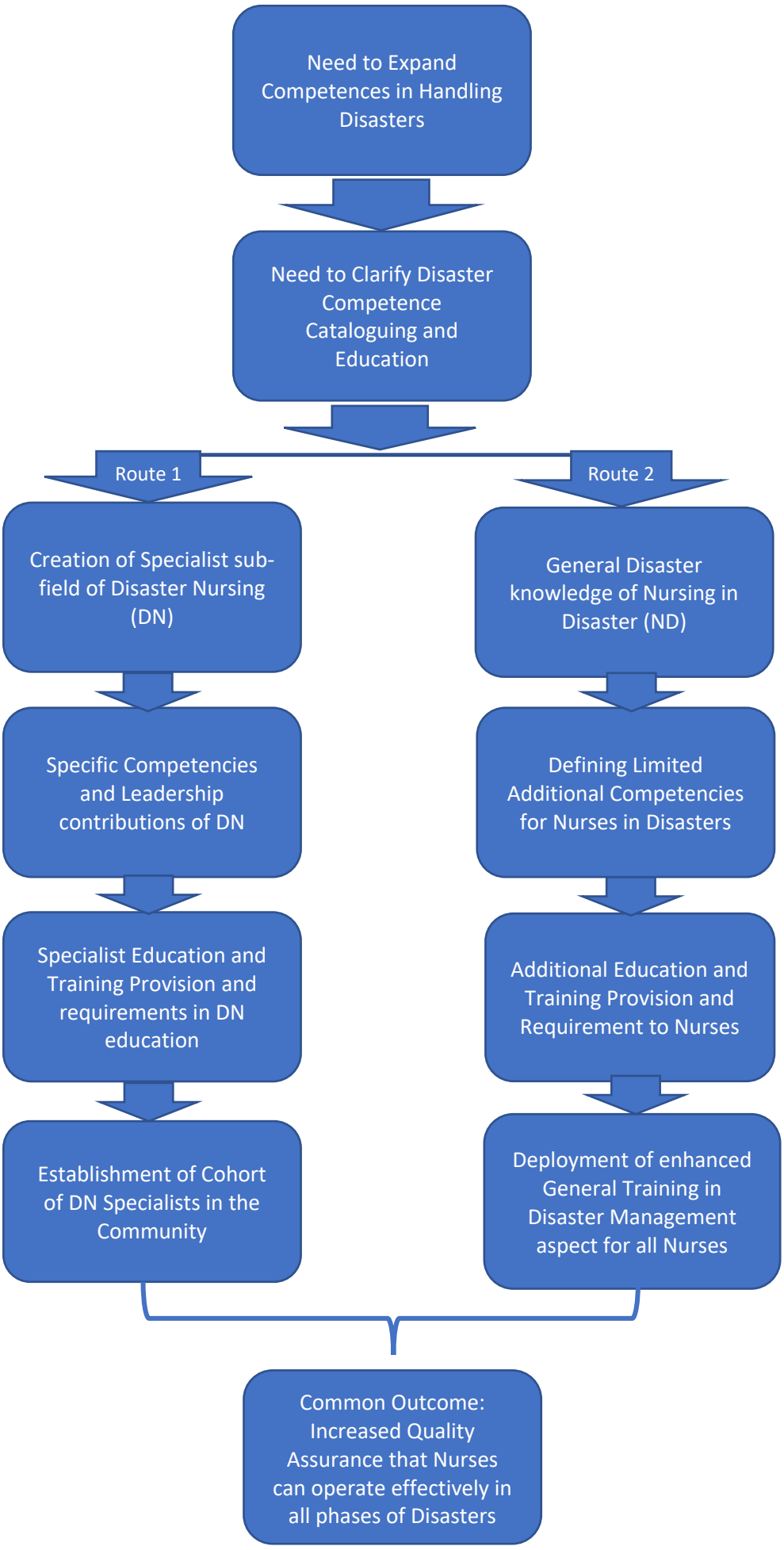
Nursing in a Disaster requires several skills and competencies to deal with the unpredictability of disaster. The Nurse must have critical thinking and problem-solving skills but must likewise have competence to stabilise a victim until they can be treated. A Nurse working in a disaster must be a team player together with other professionals, such

as Police, Fire brigade and Paramedics, to ensure that the highest level of care is delivered. Nurses working in a Disaster must also be able to take care of those affected in the immediate aftermath of a disaster.

The above two definitions help to both pave the way for giving characteristic indicators of the two differing nursing positions as well as setting out the educational, training and exercise requirements in order to be prepared for a disaster. Whilst it is clear that the basic Nursing education should be the same for all Norwegian Nurses, the experience that they gain during their employment and work will differ depending on the role that they will have.

3.2 Conceptual Framework

Figure 3.1 Conceptual Flow of the Typology



The conceptual framework for disaster nursing is based on indicators crafted in such a way that when assembled they would demonstrate what a study would look like as a specialist sub-field and equally what a framework for post graduate courses might contain to help graduate nurses to be prepared for nursing in disaster. The conceptual Framework involves three stages; namely:

Stage 1 (Need/Challenge Identification)

leading to

Stage 2 (Development Routes)

and then

Stage 3 (Outcomes)

The two different routes are illustrated by Figure 3.1. The first stage of **Need/Challenge Identification** reveals that effective handling of disasters requires universal recognition of the need to expand the competences among nurses and that nurses have an integral role in handling disasters. This implies that these competences need to be accompanied by a corresponding universal recognition and consensus and have to be defined together with the educational requirements which are demonstrated by the second stage.

The second stage encompasses two distinctive, yet also interrelated, **Development Routes**; namely one that seeks to establish specialist Disaster Nurses (DN) and the other that seeks to improve the overall competencies of general nurses in disaster management through enhancement of topics within general nursing education (ND) – see also Figure 3.1. Clearly the first route recognises that Disasters represents a new emerging specialist sub-field of Nursing where specific competencies and leadership contributions are necessary, in other words DN is a specialist concept. DN education requiring definition of the specialisms, training and requirements that are necessary in order to create a small leadership cohort of DN at the Municipality in the present study (community) which includes the Home Care Level. The second route will lead to the definition of the additional and limited extra competencies and enhancements that General Nurses require in order to apply general nursing skills to Disasters more effectively. This will help to define the additional educational and training provisions as well as the requirements to be added to the present general training requirements of nurses and lead to the application and dissemination of enhanced general training in disaster management aspects of all General Nurses working in the Municipality and Home Care Environment.

This leads to stage 3 of clarifying the **Defined Outcomes and Impact**. The most important of these outcomes will be, first, the delivery of a permanent comprehensive organisational, educational and training strategy and secondly, increased quality assurance at the community and home care level that nurses can operate effectively in relation to disasters and all aspects of the disaster management cycle.

The focus here is also on the conceptual indicators that will be useful in establishing the differences between the specific Disaster Nurse (DN) and a better trained general nurse who is more prepared for Nursing in a Disaster (ND). These indicators are important for achieving another two of the study objectives, namely:

- To develop a disaster nursing conceptual framework using rural Norway as a case study and;
- To draw conclusions and make recommendations for nursing policy in rural Norway based on research findings.

The International Council of Nurses (ICN) and the World Health Organization (WHO) saw the necessity for building capacities of disaster knowledge and competencies for nurses at all levels that might experience a disaster (see Chapter 2, section 2.3.2). This is the reason for the fact that the ICN and WHO developed a framework of disaster nursing competencies (WHO and ICN 2009). This framework of competencies is illustrated by Figure 2.6 in Chapter 2. Importantly, these competencies are organised within each phase of the Disaster Cycle (Coppola 2015, p.12). The overview of competencies required within each of the Disaster Phases will enable the Disaster Nurse (DN) to in effect act as a Disaster Manager or at least have an overview of the management of a disaster together with the others in the Disaster Management Team. This should also empower the Disaster Nurse (Veenema and Woolsey 2013, p.17) to better focus and be set in the required Health Care resources to the appropriate part of the Disaster so that the highest achievable level of care is delivered. In contrast to the Disaster Nurse, the nurse carrying out nursing in a disaster has a different work focus and workload which does not primarily include the distribution of the required health care resources and competencies of a Disaster Nurse (See Table 3.2). When nursing in a disaster, the nurses must know how to use all the nursing competencies that have been acquired for the disaster setting so that the highest achievable level of care is delivered. The present indicators that are displayed in Table 3.2 are based on the specific roles emanating from the definitions of the goals of the nurses in the previous section.

Table 3.2 Comparison of Conceptual Indicators

Indicators:	Disaster Nursing:	Nursing in Disaster:
Planning	Must be involved in the development and review of all levels of the Municipal Disaster Plan and the Health Care Plan. Hazards assessment	Need to have detailed knowledge about both the Municipal Disaster Plan and the Health Care Plan. Should give advice about specific local conditions if required
Leadership	Leading and Managing Nursing and Medical support - also an overview of nurses in the municipality and report to Disaster Management teams. Part of Disaster Management team or report back to team. Local knowledge and responsibility for storage and supplies of resources such as medical equipment, drugs and facilities as well as staff for disaster support.	Hands on support in Disasters
Managing communication	Leading and managing	Supplying information
Managing social media	Leading and managing	Supplying information
Motivator	Motivator for exercises and training related to disasters.	
Experience	Outline important methods and techniques. Triage in difficult circumstances. Knowledge about trauma due to disaster and treatment of psychological effects on both victims and all health personnel Dealing with severe and Arctic weather conditions.	Highly skilled using equipment and improvising Dealing with psychologically affected victims and health care staff. Familiar with how to refer victims and staff to specialist treatment

It is clear that the Disaster Nurses (DN) should be very competent leaders and managers, yet that this competence must be built and based on a deep understanding of the medical facilities and methods as well as plans that are available in a disaster situation. In order to facilitate this, there is an enhanced focus on leadership and planning skills associated with the specialist sub-field of DN (see Table 3.2). It is also essential that the Disaster Nurse have appropriate medical skills and sufficient knowledge to be able to manage complex medical situations and deal with or stabilise complex medical conditions. It might be expected for example, that DN would be trained in leadership and planning for dealing with arctic and sub-arctic emergencies in Norway and in particular areas like handling chemicals and their relationship to planning short and long-term care strategies given the prevalence and likelihood of oil-related disasters in Norway given the size of the energy sector in the country and particularly of northern Norway. The Nurse working in Disaster should also be able to deal with or stabilise complex medical conditions, but also refer to other medical staff when necessary. Consequently, the ND should need additional but limited extra competencies and enhancements in order to apply general nursing skills to Disasters more effectively. This will support the definition of the additional educational and training provisions as well as the requirements to be added to the present general training requirements of nurses. Importantly, all the above must also lead to the application of enhanced general training and participation in disaster exercises involving disaster management aspects. These exercises must include all ND working in the Municipality and Home Care Environment as well as the specialist DNs.

3.3 Comparative Experiences of Nurses

Nurses that work in the community or municipality may have differing types of employment. The type of employment will depend on whether the municipality is rural, location and the size of the municipality. Typically, in remote regions there are the Care Home nurses, Home Care Nurses, as well as, nurses in Rehabilitation Centres, Municipal Emergency Service and Cottage hospitals. However, in a Disaster response phase it is more likely that the Home care nurses will be those who are primarily involved. Furthermore, Nurses working in the Municipal Emergency Services, Cottage Hospitals and Nursing homes will also be involved. These nurses will work together with other nurses to cover a certain area or region of a municipality.

3.3.1 National Education of Nurses in Norway

A nurse educated to the BSc level in Norway will have 18 months or half the degree duration of total practise at different locations and/or hospital departments as part of the three years degree qualification. This degree format is the standard of education and training for nurses throughout Norway and is the educational and training background of a registered nurse in Norway (Melby 2000, pp.71-97). However, during employment, a nurse will gain experience and consequently develop skills which depend on the working environment, situation and position (Holm et al. 2017). It is pointed out in the previous chapter that graduate nurses both have education, training and practise in terms of leadership and management. However, these nursing skills are not always widely acknowledged, communicated or understood outside the nursing profession.

3.3.2 Home Care Nurses in Norway: The Rural Community Context

In terms of nursing practise in rural regions of Norway, the Home Care Nurse visits everybody who requires a health care service to their homes in order to give them medication and medical care on a regular basis[32]. This may not only be the disabled, infirm or elderly, but anybody that needs health care service thus enabling them to live at home rather than at a Care Home or Hospital (Holm et al. 2017; Kattouw and Wiig 2018). An important part of the set of skills that this nurse will acquire is the ability to work independently and alone. However, the Home Care Nurse must also be able to make medical decisions about patients, such as if they need to be seen by a General Practitioner (GP), a specialist or be sent to a hospital. Other related, but important practical skills are those necessary to stabilise a patient who has suffered a stroke, suffered fractures, falls or other conditions needing further specialist medical intervention. It follows that the ability to work with other medical staff and health professionals (e.g. Physiotherapists) is essential and that they understand and are able to collaborate with the emergency services. Related to this, the Home Care Nurse must additionally be able to improvise and find creative solutions without specialist equipment. At the same time, it is necessary that the nurse can quickly acquire skills to operate new medical equipment.

Given the sparse population in the rural regions, the nurse must especially be able to lead and manage none medical staff in order to perform necessary tasks and operations during difficult conditions. Due to the small number of nurses in these large regions, the Home

[32] https://lovdata.no/dokument/NL/lov/2011-06-2

Care Nurse is also likely to be the nurse on duty for Care Homes at night since the night staff at Care Homes is likely to be an auxiliary nurse or a non-medically educated staff member (Ree and Wiig 2019). The Home Care Nurse must also be used to adapt to the seasons with considerable changes in weather conditions and the requirements that this affords in terms of clothing as well as driving equipment both for the nursing staff and their patients. The Home Care Nurse will have a good overview of the living conditions of patients from a practical view point. This nurse will also know about their patients' relatives as well as their patients' social network. In recent years it has also become important to understand people with drug or alcohol related issues. It is essential for these nurses to understand and deal with minority cultures that are present in rural Norway either because of immigration or because they are indigenous minority cultures. The nurse is also the person that understands the information and what form it must take in order to support the clients' needs. If a disaster strikes in a rural region of northern Norway, it is the home care nurses with the above type of experiences that will be those who have to initially deal with casualties. This is because of the availability of Home Care Nurses, based on the fact they cannot by law[33] refuse a patient, that they are likely to be the front line in a disaster in a municipality. In home care, teamwork seems to be a significant contributing factor for patient safety, and consequently building good teams of nurses with mutual trust and collaboration is therefore important for both patients feeling of safety and actual safety as reported by Ree and Wiig (2019).

The Home Care Nurse will also be accustomed to that it might take a considerable amount of time before any other medical support arrives so that these nurses may have to lead and coordinate other or unskilled staff, improvise medical treatment and equipment thus ensure that the casualties are taken care of as well as possible before any medical support and help arrives. To some extent, this is not unlike the setting for Nursing in Disaster. Other nurses working in a municipality have a different set of work tasks compared to the Home Care nurse and many are likely to be based at a Care Home or other permanent location as the working domain. In rural Norway the casualties may well be brought to the Care Home, where there is a GP on duty, (Havig et al. 2011).

[33] https://lovdata.no/dokument/NL/lov/2011-06-2

Plans, laws and regulations that govern all nurses' work will also have to be well known by these nurses. Importantly, an ethical consciousness that follows all the nurses' work is essential when taking care of their patients.

Table 3.3 Expected Experiences of Home Care Nurses working in rural regions of northern Norway.

Home Care Nurse Characteristics
Working independently Teamwork when required Making independent medical decisions
Able to carry out first aid and dealing with critical situations Collaborate with other medical professionals and other professional groups. Being creative. Dealing with people in different health situations. Dealing with relatives and next of kin Follow up prescriptions for people staying at home.
Need to keep updated about health care, medicine and medical equipment Considerable local knowledge both in terms of geography and dealing with Arctic weather Be able to use available facilities for medical use
Adaptability and flexibility Knowledge of plans, laws and regulation that governs Home Care. Be available for night nurse support for local Nursing Homes. Used to work with ethics in mind, because they carry out their work inside peoples' homes
Evaluate patients need for information and education. Dealing with different cultures such as indigenous people. Meeting people in critical situations and people with psychological and cognitive conditions. Palliative care at home. Follow up prescriptions for people in their homes.

3.3.3 DN and ND Considerations/Observations for Home Care Nurses

The Home Care Nurses in rural northern Norway are very likely to be the front line if a disaster that takes place in or affects a municipality. Many of the acquired skills through experience of the home care nurse as shown in Table 3.3 are similar to those required by a Disaster Nurse and some of the skills are those required when Nursing in Disaster. This paves the way for a consideration of establishing education of Disaster Nursing and Nursing in Disaster in rural northern Norway. The Home Care Nurses as part of their work are always on alert and ready for reaching out to their patients at short notice.

Table 3.4 Home Care Nurse Characteristics directly compared with requirements for Disaster Nurses (DN) as well as Nurses working in Disaster (ND).

Essential skills from a Home Care Nurse perspective	Disaster Nurse characteristic	Nursing in Disaster characteristic
Working independently	Essential	Essential
Carry out first aid and dealing with critical situations	Essential	Essential
Adaptability, Flexibility and Creativity	Essential	Desirable
Patient evaluation	Essential	Essential
Teamwork and collaboration with other professions	Essential	Essential
Care for relatives and next of kin	Essential	Essential
Nursing people with a variety of health problems	Essential	Essential
Updated in health care research	Essential	Essential
Knowledge of the community geography	Essential	Desirable
Be able to work in arctic conditions	Essential	Essential
Knowledge of available facilities and equipment in the local community for medical use	Essential	Desirable
Knowledge of laws and regulation that govern their work	Essential	Essential
Knowledge of plans that involve their work	Essential	Essential
Work in an ethical manner	Essential	Essential
Know how to give health care to people from differing cultures	Essential	Essential
Know how to care for people in critical situations with psychological and cognitive conditions	Essential	Essential
Palliative Care	Essential	Essential
Follow up prescriptions for people in their homes.	Essential	Essential

It would be realistic and natural given the conditions and sparsity of population to give them added education, support and skills so that they could become the Nurses for Disaster required to improve the disaster preparedness of rural northern Norway. However, a link to the Disaster Management as well as coordination with the other services that should deal with a disaster is completely necessary. Furthermore, the Home Care Nurses that have become Nurses in Disaster during the response phase of a disaster need a high level and good quality leadership.

To ensure that the response phase of a disaster is treated with the highest achievable level of care it is also necessary that the Home Care Nurses team is supplemented by a Disaster Nurse (DN). This Disaster Nurse (DN) would deal with all aspects and levels of the disaster cycle in terms of coordination with the other disaster services and lead the general nurses, now the Nurses in Disaster (ND), during the disaster response phase. The Disaster Nurse would lead all of the other aspects of the disaster management cycle (Disaster Risk Reduction/ Mitigation, Preparedness and Recovery). The Disaster Nurse will have specialist training that recognises that the potent but complicated mix of high level and creative nursing skills with disaster management leadership requires specialist training and recognition of DN as a sub-field of nursing.

The consideration is then, that for each rural north Norwegian community there will be a small number of Community DN who as nurse leaders that can coordinate with and may also lead the general Home Care Nurses or Municipality Nurses, now Nurses in Disaster, during the disaster response and then deal with all of the aspects of the disaster management cycle. This approach will greatly improve the Disaster readiness of the rural north Norwegian regions.

3.4 Nursing Educational Requirements

There are several considerations to be made in order to set out appropriate requirements for the education and training to become a Disaster Nurse or for a nurse to be able to work in a disaster. Some of these considerations are set out in the previous sections and deal with the characteristics and conceptual indicators. In order to achieve the goals that are outlined, the educational attainments should reflect the characteristics and definitions of both DN and ND. The education must also consider and to some extent be based on the ICN framework for competencies and make sure that these competencies are adapted for Norwegian rural conditions. A backdrop for any postgraduate education for nurses must be the Norwegian BSc in Nursing and the practical training that the degree entails. It was also established in section 3.2 that Nursing in a Disaster (ND) means nursing in the Response Phase of a disaster, whilst the DN must be involved in all phases of the disaster. For dealing with disasters in rural northern Norway, the special climatic conditions that prevail there must also be taken into account in both education, training and exercises. In addition to the fundamental BSc in Nursing and the post graduate MSc for Disaster Nursing, it is also of great importance for nurses that might serve in a disaster to be

involved in regular exercises as well as training courses to update knowledge and competencies.

The educational requirements of Disaster Nurses as defined earlier spanning all phases of a disaster are displayed in Table 3.5 together with the requirements of disaster competencies for graduate nurses. In addition to the educational specific needs, the training and exercise requirements are also pointed out in the table. The definitions in section 3.1 make it clear that additional leadership and management education is necessary for the Disaster Nurse's MSc postgraduate study. Further nursing specific advanced competencies in the area of triage and first aid are also included in Table 3.5. It is pointed out that skills in using modern medical equipment is needed as well as understanding of medical physics to the extent that improvisations can be carried out and preformed when required and necessary. Further expected qualifications are those involving communications and digital skills. The Disaster Nurse must also have knowledge related to special disaster damage such as those emanating from Biological, Chemical and Radiological hazards. The competencies must include advanced first aid for Biological, Chemical and Radiological injuries and how these injuries are treated in the immediate aftermath. Because of the complexity of the biological, chemical and radiological subject areas, it is essential that Disaster Nurses know when, how and who to contact in order to obtain information on how to initially deal with injuries caused by such agents when required.

On the other hand, it is also understood that disasters give rise to considerable psychological stress both for nurses, other health care staff, patients and disaster victims the result of such conditions are that the Disaster nurses in particular, but also nurses working in the disaster area should have plans and be part of plans for dealing with the psychological stress. Importantly, the Disaster Nurses must also have been part of developing the local municipal disaster management plans and the municipal health care plans thus pointing the finger to include planning, organisation and collaboration as parts of the MSc syllabus.

Table 3.5 Expected impact on Nursing education requirement

	Prevention/ Mitigation Competencies	**Preparedness**	**Response Competencies**	**Recovery/ Rehabilitation Competencies**	**Response Competencies**
	Disaster Nursing MSc	Disaster Nursing MSc	Disaster Nursing MSc	Disaster Nursing MSc	Bachelor in nursing (ND)
Community Resilience	Be able to identify hazards and the effects of specific disasters have on the community. Identifies challenges to the health care system and works with the multidisciplinary team to mitigate the challenges.				Know about challenges the health care system could have in a disaster
Collaboration	Collaborates with organisations and governments to build the capacity of the community to prepare for and respond to a disaster.		Participates as part of a multidisciplinary team and with relief organisations to address basic needs of the community (e.g. shelter, food, water, health care). Works with appropriate individuals and agencies to assist survivors in reconnecting with family members and loved ones.	Collaborates with the existing health care community for health care maintenance and health care.	Know the collaboration partners for disaster and be able to collaborate.
Disaster planning	Contributes in developing, evaluation and modification of the community disaster plans at all level.			Participates in analysis of data focusing on improvement of response	Know about disaster plans that regulate nurses work in a disaster. Know the health preparedness plan and the different departments disaster/crisis plans and their role in the time of a disaster.
Health Promotion and health care	Understands the principles and process of isolation,		Understand how to prioritise care and manage multiple	Assists local health care facilities in recovery	

	quarantine, containment and decontamination. Identifies vulnerable population and coordinates activities to reduce risk	Applies the national approved ethical framework to support decision-making and prioritising.	situations. Applies accepted triage principles when establishing care based on the disaster situation and available resources Dealing results of extreme weather conditions Evaluates the impact of nursing interventions on different populations, vulnerable people, and cultures and uses evaluation results to make evidence- based decisions.	Identifies the changing needs of survivors and revises plan of care as required.	Identifies vulnerable population and understand the principles of isolation. Understand the national approved ethical framework to support decision-making and prioritising of nurses work in disaster.
	Identify the need for medical and medical equipment store.		Manages resources and supplies required to provide care in the community.		Knowledge about the medical and medical equipment store.
	Works with the community to strengthen the health care system's ability to respond to and recover from a disaster.		Applies critical, flexible and creative thinking to create solutions in providing nursing care to meet the identified and anticipated patient care needs resulting from the disaster.	Evaluates nursing response and practices during the disaster and collaborates with nursing organizations to resolve issues and improve response	Are familiar with evaluation of nurse's work
			Describes the signs and symptoms of exposure to chemical, biological, nuclear and explosive agents -Identifies unusual patterns or clustering of illnesses and injuries that may indicate exposure to biological or other		

			substances related to the disaster.		
			Recognise health and mental health needs of responders and make appropriate referrals		
			Prepares patients for transport and provides for patient safety during transport.		
Psychological Care	Develops plans to meet short- and long-term physical and psychological nursing needs of survivors		Identifies survivors and responders requiring additional mental health nursing support and refers to appropriate resources. Provides appropriate psychological support for survivors and responders	Review the plans to meet short- and long-term physical and psychological nursing needs of survivors See the need for Debriefing and support for health care responders	Understands the psychological impact of disasters on adults, children, families, vulnerable populations, responders and the community.
Policy Development	Demonstrate an understanding of relevant disaster terminology. - Knowledge of the phases of disaster management continuum		Describes the phases of community response to disaster and the implications for nursing intervention		Know the phases of disaster and the nurses' health care role in these phases.
	Participates politically and legislatively in the development of policies related to disaster preparedness and response.				
	Know the role of government and organisations in disaster planning and response.				
	Interprets role(s) of nurses in relation to other members of the team.				

Legal Practice		Knowledge about the legal implications of disasters and emergency events (security, maintaining, confidentially), that will have an effect on the nurses work in a disaster.			Understand the legal implications of disasters and emergency events that will have an effect on the nurses work in a disaster.
		Practises in accordance with the laws and regulations governing nurses and nursing practice and be updated on disaster medicine and disaster research	Advocates for survivors and responders to assure access to care		Practises in accordance with the laws and regulations
Communication and Information Sharing		Knowledge about the chain of command and the nurse's role within the system. Provides up-to-date information to the disaster response team regarding the health care issues and resource needs.	Provides community-based information regarding health implications of the disaster		Understand the chain of command and the nurse's role within the system and know who to provide up-dated information.
Education and Preparedness	Knowledge in how to prepared the community for disaster situation.	Takes on a leadership role in the development and implementation of training programmes for nurses and other health care providers. Knowledge in how to provide the community with disaster information and education in disaster		Be able to evaluates the need for additional training and obtains required training	Participate in disaster training programmes

3.5 Summary

The definition, concept and emergence of the Disaster Nurse (DN) as a leader and part of the Disaster Management team is a specific contribution, as are the specific educational requirements for nursing staff (ND) that might have to deal with disasters. Furthermore, the chapter demonstrates and gives a further contribution in as much as the two educational and training routes for nursing staff that will help the community to deal with a disaster, are in addition based on skills that are wanted and required by the work that nurses carry out in a rural municipality as shown by Table 3.4.

It is important to highlight that these routes are also interrelated and can be complementary so health leaders can choose to develop one of the routes or both routes in combination. Indeed, to achieve joint maximum outcomes in terms of the delivery of a comprehensive strategy and building quality assurance in the community, then the preference would be for the development of both routes to achieve maximum effect and improvement in handling disasters in the community setting.

Consequently, and in summary, the Disaster Nurse and Nursing in Disaster training and educational paths will be of benefit to the remote, rural near arctic communities on four accounts:

(i) Makes the community resilient and prepared for a disaster through being better able to respond in health care terms.
(ii) Ensures that the municipal nurses are well trained and educated for the health care tasks in the remote regions
(iii) Ensure that the municipal nurses feel competent and confident.
(iv) Ensures that the Disaster Management team includes Disaster Nurse competencies that deal with all phases of a disaster as recommended by WHO and ICN.

The Disaster Nurse must have MSc education in addition to the BSc in Nursing so that quality of Disaster Nursing care will be available, whilst it is recommended that the nurses involved with Nursing for a Disaster need specific post graduate courses and training as proposed by Table 3.5 adapted from the recommendations by WHO and ICN.

The overarching results that are set out in the preceding sections and tables are claimed to be a major contribution to nursing in the remote rural regions and to ensure that these regions are better able to deal with disasters.

Chapter 4

Methodology and Methods

4.0 Introduction

This chapter presents a qualitative methodology designed to facilitate an open and responsive approach to the understanding of the Disaster Nursing concept in the rural part of northern Norway. The philosophical foundation that has inspired and guided the present study as well as the method used are outlined and presented in the following sections. The purpose of this chapter is to reveal a rationale for the methodological choice that is supporting this research. Furthermore, the method for data collection is also described and discussed together with the principles and techniques applied for the analysis of the data once collected. Finally, the ethical considerations, their validity and the limitations of the study are also discussed.

4.1 Philosophical and Theoretical Framework

Research philosophy relates to the development of knowledge and how the researcher views the world. Phenomenon as a concept comes, originally from the Greek word *'phainomenon'*. In Greek, the word means how something appears or is shown to us (Heidegger 1962, p. 51). Phenomenological research is characterised by and begins always in the lifeworld, as the *"world of the natural attitude of everyday life"* according to Van Manen (1990, p.7). He referred to Husserl who described it as the original, pre-reflective, pre-theoretical attitude (Van Manen 1990, p.7). Investigating the lived experience involves focus on the meaning of an experiential phenomenon of a human experience from the perspective of the individuals who experience it, according to Van Manen (1990, pp.31-32). Phenomenological research is therefore described by Husserl, as turning to "the thing themselves" in order to get wisdom from understanding other humans lived experiences (Van Manen 1990, pp. 31-32). Edmund Husserl (1859-1938) is often referred to as the founder of human phenomenology, but he was not the first to use the terminology (Dahlberg et al. 2011, pp. 30-31). According to Dahlberg et al (2011, p.30), already during the 18th century, the concept of phenomenology as a science of appearance was described and discussed by philosophers such as Kant (b1724 - d1804) and Hegel (b1770 - d1831). However, it was Husserl's teacher Franz Brentano (b1838 –

d1917) who introduced the term phenomenology to Husserl in 1889 (Dahlberg et al. 2011, p.30). Husserl saw the life-world as the pre-given world of immediate experience (Van Manen 1997, p. 182). Husserl's own words to go "to the things themselves" and this phenomenological idea gives research more trustworthiness because the object is being understood in a context (Dahlberg et al. 2011, p. 32). This could be an object, a matter, a "thing" or a "part" of the world as it presents itself to a subject such as an experience according to Dahlberg et al. (2011, p. 33). This study is embedded in a hermeneutic tradition, with an understanding that hermeneutics and phenomenology as philosophical approaches are epistemologically linked (Dahlberg et al. 2011, p. 95) and the distinction between them may seem artificial.

Hermeneutic is the philosophy of understanding gained through interpretation explained in a contextual meaning (Dahlberg et al. 2011, pp.65 – 66) and it was introduced as a systematic method more than two hundred years ago by Friedrich Schleiermacher. Furthermore, in some of Schleiermacher's latest work he expanded the theory to include any kind of text to examine the act of understanding (Dahlberg et al. 2011, p. 67). The hermeneutic phenomenological approach is concerned with uncovering the life-world of people, and understanding the meanings of experiences as they are lived (Dahlberg et al. 2011, pp.32-33). Nurses' experiences are increasingly valued as important sources of knowledge for understanding the acts of health care. Learning from lived experiences of nursing in the rural municipal life-world is the main concept in the present theses and gives access to the phenomenon of nursing in emergency situations, and through a hermeneutic approach discovers the need for a disaster nursing concept. Collecting stories and narratives in qualitative research is ever increasing and was as early as 1993 described by Reissman (1993), as the "interpretive turn" in social science (Reissman 1993). Narrative inquiry refers to a group of qualitative research approaches that uses stories to describe human action, with events and happenings configured into a temporal unity by means of a plot (Polkinghorne 1995, p. 5).

4.1.1 Research Methodology

The term methodology refers to the philosophical framework underpinning the research approach that is used (Creswell and Creswell 2018, p. 32; Van Manen 1990, pp. 27-28). Methodology is the theory behind the method and it provides the justification for using a particular approach and has implications for the research methods adopted (Saunders and Rojon 2014).

This study is based on narrative approaches with methodological reflections on data grounded in the hermeneutic phenomenological tradition (Dahlberg et al. 2011). A qualitative approach is a method studying how human things work (Stake 2010, p. 14). In contrast to quantitative studies where research design is specified before collecting the data, a typical feature of qualitative methods is a design that evolves as the researcher makes on-going decisions reflecting what has already been learned (Polit and Beck 2004, p. 245). The history of science includes good qualitative thoughts, such as those of Newton, Curie, Galileo and Watson and Crick according to Stake (2010, p.11). An important example of qualitative thinking are the thoughts of Newton when he studied the apple falling from the tree which gave rise to deterministic classical physics. Furthermore, Stake pointed out that researchers have both in the past and in the present times used qualitative and quantitative research methods. "Qualitative thinking is intermixed within all steps of scientific work", Stake (2010, p. 13).

The present study takes a case study approach involving a qualitative method to elucidate the complex nature of disaster nursing and to investigate the concept of disaster nursing in rural Norway. The rationale for selecting this approach as a single-case study rather than multiple- case design is that it allows an in-depth analysis of situations and individuals. Consequently, it enables relationships to be fully explored; in essence, it takes a 'focused slice' of the whole field. Robson and McCartan (2016) define a case study as follows:

"*Case study is a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real-life context using multiple sources of evidence*" (Robson and McCartan 2016, p.150).

A case study is a strategy based in empirical research that focuses on the particular 'in context', and like action research, it involves using a variety of methods for data collection (Willis and Anderson 2010, p. 95). The array of evidence is used in a converging manner to defined the 'facts 'of the case and is modelled on the concept of triangulation (Yin 2012, p. 149-150). Patterns of convergence are identified to develop or corroborate an overall interpretation and ensure comprehensiveness. Case studies are attributed with the ability to enhance understanding that is a typical example of a special phenomenon (Polit and Beck 2004, p. 259). It is suggested that this methodology is eminently suitable for research in a country such as Norway and specifically rural

Norway, because of the inherent strength in accessing data about complex social situations and it may serve the important role of clarifying concepts (Polit and Beck 2004, p. 259). Moreover, narratives from single case studies have been likened to 'virtual reality' and may therefore present a substantial advantage, which is the opportunity to inculcate authenticity and reality (Polit and Beck 2004, p. 259).

Characteristics of case study research are presented in Table 4.1.

Table 4.1 Characteristics of case study research

Case study research characteristically emphasis		
Depth of study.	**rather than**	**Breadth of Study**
The particular.	**rather than**	**The general**
Relationship/processes	**rather than**	**Outcomes and end-products**
Holistic view	**rather than**	**Isolated factors**
Natural settings	**rather than**	**Artificial situations**
Multiple sources	**rather than**	**One research method**

(adapted from Denscombe 2003, p. 54)

Notwithstanding, a criticism of this type of approach is that recommendations cannot be made beyond the case studied and, therefore, there is restricted external validity (Robson and McCartan 2016, pp. 152-153). However, single case studies can enable generalisations to other cases that represent similar theoretical conditions. To achieve this is a matter of analytical generalisation (using a single case study to illustrate, represent or generalise to a theory) (Yin 2012, p. 148). The central issue of concern is the quality of the theoretical reasoning (Yin 2012, pp. 148-150). Furthermore, a case study approach is used to understand a real-world case (Yin 2018, p. 15) such as the disaster nursing phenomenon in a Norwegian context.

4.1.2 Research Design

Research design is described as an overall strategy for the approach that the researcher is to apply in order to conduct the research. It describes the method and procedures that are used in the present study in order to fulfil the aim and the objectives of the study. Furthermore, this section will also identify the sources from where the researcher has generated the data, how this was carried out and the process applied during the analysis

of the data. Finally, this section considers the ethical issues, limitations of the study and the validation of the study (Saunders and Rojon 2014).

The extent and complexity of data collection are characteristics that define a case study design. Phenomenological research is a study of the lifeworld that enables the researcher to gain a deeper understanding of everyday experiences and it also captures the participant's opinions and feelings (Van Manen 1990, pp. 9 - 12). Phenomenology as a philosophy is connected to Gadamer's hermeneutic focus on the interpretation of meaning in texts where preconceptions are integrated into the research findings (Dahlberg et al. 2011, pp. 95, 236-238).

Lifeworld is a central concept in phenomenology, understood as a pre-scientific concrete and perceptual world of experience that is a basic prerequisite for understanding and meaning (Van Manen 1990, pp. 36-41). Consequently, it is not possible to refer to experiences without talking about meaning at the same time (Dahlberg et al. 2011, p. 66). Narrative interviews will provide data that give a more holistic picture in a meaningful context as suggested by Dahlberg et al. (2011, pp. 180). Researchers have the freedom to tell a story of how things function through the use of other people stories (Stake 2010, p. 170). According to Stake, storytelling is the qualitative researcher's craft. Not all stories emanate directly from persons lived life, they could also arise from history as a story from an organisation or from a social movement (Stake 2010, p. 170). The story of this thesis is based on participants' personal stories related to the Disaster Nursing phenomenon.

Using interviews to explore the experiences and knowledge of the disaster nursing phenomenon from municipal nurses working in sub-arctic rural regions of Norway, may give a new and different experience from disaster related work that will be an important contribution to the project (Sandelowski 1998).

The present study is based on the results of semi structured interviews with nurses and leaders to obtain the informants experiences and view of mass casualty and disasters phenomenon and further, to reveal the implications of the Disaster Nursing phenomenon (Serry and Liamputtong 2013, pp. 40-41,46-47; Van Manen 1990, pp. 66-67).
Semi structured interviews have been conducted with open-ended questions to encourage the participants to speak freely and tell their story in their own words (Polit and Beck 2004, p. 342). This freedom generated a more flowing conversation between the

participant and the researcher. However, the researcher also used follow up questions to explore interesting themes as well as to clarify statements by the participants (Dahlberg et al. 2011, pp. 191-192; Sandelowski 1998).

4.2 Data Collection and Analysis

To fully investigate the Disaster Nursing concept in rural Norway, it was important to recruit participants from different communities in sub-arctic Norway, especially the rural areas. Furthermore, to get a wider understanding of what is expected from nurses in a disaster event, nurses' leaders were also asked to participate in the study. The study recruited participants through gatekeepers who were familiar with the rural community health area (Polit and Beck 2004, p. 56). Whilst there were no specific requirement for the participants to have had direct experience from working in a disaster, most of the participants with long experience working in the remote, rural areas, have had to work on their own, sometimes dealing with the results of accidents and making decisions, far away from Accident and Emergency units of city hospitals, thus their experience, it could be argued, would be 'a kin to' that of nursing in a disaster. To investigate the participant's experiences with disaster phenomena in the community, the inclusion criteria were as follows:

- The nurses needed to have experiences from working in the community health care, psychological crisis team or experience as leaders in the same area.
- To have variation in data it was important to gather data from informants of different age, genders, culture, different working experiences and different geographical area (Dahlberg et al. 2011, p.175).

Furthermore, Dahlberg et al. (2011, p.175) claim that a variation in the data is more important than the question of sample size (n). However, the present study has a sampling frame of n=16 participants.

In order to understand the concept of Disaster Nursing, this study used data collection conducting interviews and relevant documents, which provided a consistent picture of the phenomenon (Polit and Beck 2004, p. 432). In the present study using official and government documents that were relevant for Disaster Nursing, were useful data to understand the context (e.g. resources and regulations) that nurses were working under and that strengthened the overall results of the study.

Lifeworld is a central concept in phenomenology, understood as a pre-scientific concrete and perceptual world of experience that is a basic prerequisite for understanding and meaning (Van Manen 1990, pp. 36-41). Narrative interviews will provide data that gives a more holistic picture in a meaningful context (Dahlberg et al. 2011, pp. 180). Using interviews to explore municipal health nurses experience and knowledge of disaster nursing phenomenon may give a different experience from disaster related work and that will be an important contribution to the project (Sandelowski 1998). The current thesis used a qualitative method approach where interviews were the main source in order to have a deeper understanding of the disaster nursing phenomenon in a sub-arctic, rural, Norwegian context (Dahlberg et al. 2011, pp. 85-88; Van Manen 1990, pp. 77-78).

4.2.1 Sampling

The research was carried out in the rural community areas of the three of north Norwegian counties. This collection of data took place during autumn 2018 and spring 2019. All participants had worked or were working as a nurse covering between 2 and 38 years of service. Participants worked in a rural municipal health care system with the number of inhabitants in the local municipality varying from 1100 to 16 500 inhabitants.

Most of the participants were recruited through their leaders, but some were recruited through a gatekeeper. At the start of the recruiting process of participants, this study had several gatekeepers helping with the recruitment, but importantly only one was able to recruit informants. Therefore, the researcher wrote to several municipal heads of health care units and departments who were in charge of the nurses as well as their nearest leaders. The study was presented to them, together with questions of permission to recruit informants (Appendix 1). The recruitment process resulted in that most of the participants were recruited through their leaders. However, it must be noted that many of the participants were located in different parts of sub-arctic northern Norway and that the researcher ensured that the sample included a diversity of regions and remote communities, travelling up to 1000 km each way in some of the cases, in order to conduct the interviews.

All the informants, both the leaders and the nurses have an educational background as graduate nurses and their working experiences as nurse varied from 2 to 38 years. The inclusion criteria were as follows:

- Nurses should have experiences from working in a Norwegian rural municipal health care system.
- Leaders should be responsible for leading and managing nurses in Norwegian rural municipal health care system.

All of the participants were recruited from remote regions, the three arctic northern counties of Norway, Nordland, Troms and Finnmark. Furthermore, the participants worked at four different municipalities all of them located north of the arctic circle. If we so look at the equality of male and female nurses in the study there were only four male nurses who participated in the study. This reflects the low number of male nurses in Norway, only 11% of the nurses[34] being members of the Norwegian nursing organisation (NSF) are male. Because of the unequal split between male and female nurses in Norway there were no criteria of gender in the inclusion criteria. With this in mind this study managed to recruit four (25%) male participants, two who worked as nurses and two who worked as leaders. However, since the main focus of this PhD was to study the need for disaster knowledge among nurses, it was important to recruit nurses and leaders who worked in areas or regions where nurses would be in the frontline, perhaps the only medical staff, if a disaster was to strike. In rural areas these are the nurses working for the municipality. This takes us to the municipal health care system and especially the rural region of Norway where there are long distances between hospitals and challenges with recruiting doctors to the municipal health system (Abelsen et al. 2020, pp. 9, 11). In these regions, nurses may be the health care profession with the highest health care education, who have the best knowledge of the community and are responsible for the municipal inhabitant's health care. Therefore, to explore the nurses' experiences of working in such a health care system, it was important to recruit municipal nurses in order to find out if there is a need to learn more about disaster topics and if there are, what kind of disaster knowledge do they miss?

Furthermore, to reveal if nurses need to learn more about nursing in a disaster it was important to talk to their leaders. By talking to leaders who are responsible for nurses, would bring knowledge of leader's expectation of the nurses in a disaster event. However, the inclusion criteria did not specify that the leader participants needed to have a nursing education, despite this all of the leaders did have a bachelor in nursing. Indeed, this

[34] NSF is the fourth largest profession-based organisation in Norway with 118 846 nurses as members 01.01.2020 of this are 10726 male members: https://sykepleien.no/2020/02/fakta-om-nsfs-medlemmer.

mirroring the situation where the leaders of a municipal health care units, such as home care units and nursing home units, mostly have a nursing degree.

Because of that, most of the nurses who work in the municipal health care system have no experience of working in a disaster therefore, the inclusion criteria did not specifically require that the participants should have such experiences. Such a criterion may have excluded many potential participants. According to Yin (2018, p. 26) the researcher needs sufficient access to the data in order to illuminate the research questions. However, all participants were asked if they have experiences about working in disasters.

The participant's locations covered all the three northern counties of Norway from four different municipalities. The north-south distance covered was 1000 Km whilst the east west distance was 300 Km. In terms of understanding normal life in these northern latitudes, most locations would experience a maximum of only two hours daylight in the winter season, since the low position of the sun in the winter means that even low hills can have an effect on experienced daylight. During the summer season the midnight sun gives a 24 hours daylight experience.

In terms of major health care facilities within the municipalities; one municipality included a hospital but the area covered was 3432 square Kms with a driving time in excess of one hour to the nearest airport, another municipality included a cottage hospital covering an area of 1258 square Kms, but the cottage hospital location was 247 Km away from the nearest hospital and the municipality was only served by a short runway airfield, two further municipalities had a hospital within reach of one hour drive from the centre of the municipality, but both municipalities covered more than 500 square Km each thus driving distances within the municipalities could exceed 200Km with driving times to the local airport greater than one hour. All municipalities were located near the coast, but only one had access to a railway.

The informants that participated in the study were eight nurses and eight leaders. Nurses are defined and included as having a BSc degree in nursing with more than 2 years' experience working within a municipal health service in northern Norway, whilst the Leaders have a BSc in Nursing, experience as a nurse in the municipal health service of northern Norway and several years as leader for nurses within the municipal health

service in northern Norway. The details of the participants in terms of gender, workplace and experience, as well as, education are presented in Tables 4.2 and 4.3.

Table 4.2 Nurses participants

Nurse	Gender	Work place	Year since nursing BSc	Education after bachelor in nursing
N1	Female	Nursing Home	18	Geriatric post graduate degree and
N2	Female	Home care	25	Psychiatric post graduate degree
N3	Female	Home care	2	
N4	Male	Home care	11	Post graduate degree in supervision
N5	Male	Home care	8	
N6	Female	Home care	15	Nursing professional leader
N7	Female	Cottage Hospital	12	Nursing professional leader
N8	Female	Home care	27	Geriatric post graduate degree

Table 4.3 Leader participants

Leader	Gender	Sector	Year since nursing BSc	Leader for
L1	Female	Health	22	Head of the Municipal Health department
L2	Female	Health	17	Head of the Municipal Health care system
L3	Male	Home care	9	Leader of the Municipal Home care department
L4	Female	Home care	18	Leader of a Home Care unit
L5	Female	Nursing Home	20	Leader of a Nursing Home unit
L6	Female	Rehabilitation		Leader of a Municipal Rehabilitation Unit
L7	Male	Social Psychiatric team	33	Leader of the Social Psychiatric team
L8	Female	Nursing Home	11	Leader of a Nursing Home unit

A total number of deep detailed interviews with 16 participants were secured covering all the three counties of northern Norway within a total of four regions or host communities. The distribution of the municipalities of northern Norway is shown in Figure 2.1 of Chapter 2 demonstrating that most of them cover large areas, also including a

considerable coast line with the added responsibility that gives. It should be noted that it is not the number of participants that matters; it is what you do with them that counts (Emmel 2013, p.154). Emmel (2013, p. 155) pointed out that realistically, the sample of participants can only weakly be elaborated beforehand. Taken this into consideration and the size of the population living in the north Norwegian area together with those of the population that have an interest in the disaster nursing phenomena, it was judged that 16 informants are a representative number based on Krippendorff (2019, p. 368). Furthermore, in order to facilitate comparative analysis of findings between nurses and leaders in the study, the interview set included equal numbers of the two positions at work (recruiting 8 nurses and 8 leaders). The definition of Leader and Nurse in this context is as outlined in the inclusion criteria given in this section on page 102.

4.2.2 The Interview Process

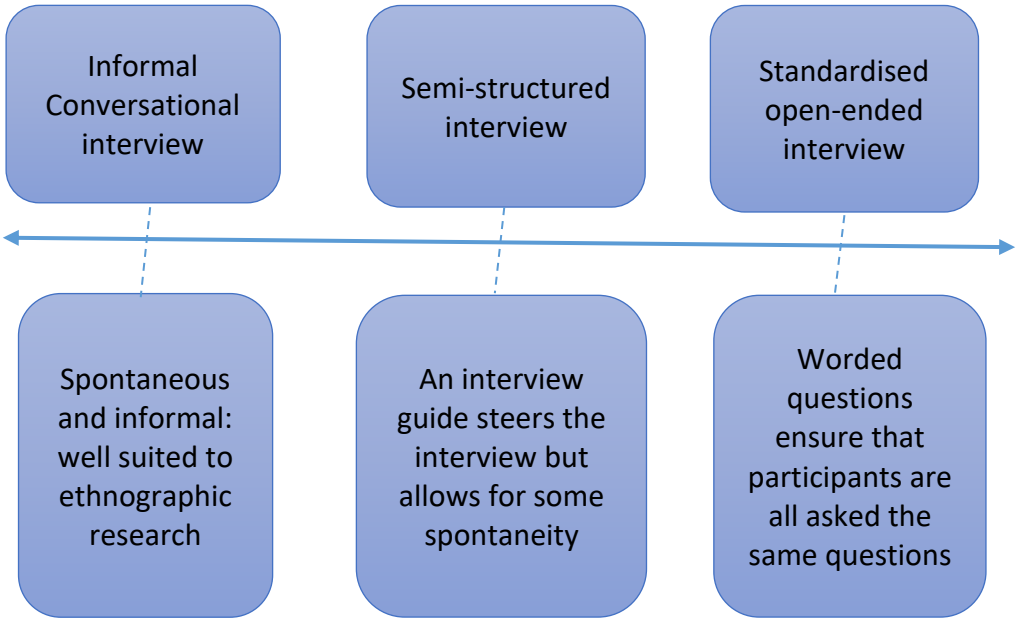
Qualitative researchers tend to collect data in the field where the participants work and function in their natural settings according to Creswell and Creswell (2018, p. 181). In these settings, the researcher can obtain a better understanding of the participant's experiences by talking directly to the people and study their behaviour in their own environment. This is a characteristic within the qualitative research (Creswell and Creswell 2018, p. 181). However, in the present study the researcher gave the participants the choice to select where the interview should take place. The main reason for letting the participants decide where the interview should take place was to provide a relaxing and unrestrained environment where the participant could be comfortable (Dahlberg et al. 2011, p.203). Therefore, five of the interviews were carried out at the university, one at the interviewees' home and the remainder of the interviews took place at the participant's place of work.

4.2.3 Semi-Structured Interview

Qualitative research interviewing has become a recognized method for investigating the lived experiences according to Kvale (2006). Max Van Manen (1990) stated that lived experiences cannot "be grasped in its immediate manifestation but only reflectively as past presence." (Van Manen 1990, p.36). In other words, human experiences will always be a reflection of what happened in the past. However, through the reflection of experiences the person will grasp the meaning of the experience. The aim of phenomenology is to transform the lived experiences into textual understanding of the essence of the experiences (Van Manen 1990, p.36). According to Yin (2018, p.118)

interviewing is one of the most important sources of case study evidence. Interviews give the researcher insight into the participant's reflection of the theme (Yin 2018, p.118; Kvale 2001, pp. 37-38). We can establish that an interview as a dialog, is an important way for the researcher to have access to the nurses and leaders experience and reflection of the Disaster Nursing phenomenon. The result will put forward how nurses should be prepared for nursing in a disaster. There are several options for giving structure to an interview according to Serry and Liamputtong (2013) as demonstrated by Figure 4.1.

Figure 4.1 Option of structure in an interview



Based on figure 3.1. Options for structure in an in-depth interview: a continuum. Serry and Liamputtong (2013, p.41).

The present study used semi structured interviews (Appendix 2 and 3) to obtain the informants experiences and thoughts of a disaster to reveal the implications of the Disaster Nursing phenomenon (Serry and Liamputtong 2013, pp. 40-41,46-47; Van Manen 1990, pp. 66-67). Indeed, to use semi structured interviews with open ended questions was to encourage the participants to speak freely so they could tell their story in their own words (Polit and Beck 2004, p. 342). This freedom will generate a more flowing conversation between the participant and the researcher. Furthermore, there were also follow up questions in order to explore interesting themes or to clarify statements by the informants based on the proposals of Dahlberg et al. (2011, pp. 191-192) and Sandelowski (1998).

As a part of the preparation, a pilot interview was conducted which enabled testing of the interview guide questions and gave the researcher opportunity to modify the guide in order to optimise the collection of data. The pilot interview is included within the study. The remaining 15 interviews took place over eight months. The average duration of the interviews was between 35 to 90 minutes and generated approximately 6000 words each. Since most of the interviews were conducted at the participants' place of work, any reason for any interruption of the interview was the time. However, the interviews that were conducted at the University and at participants home were more relaxed. This could have had an influence on the interviews however; since the participants are professional and are used to communicating in their daily work this may not have had any effect on the result.

The interview guide has its root in the findings from the document and literature review in Chapter 2 and the conceptual landscape, Figure 2.3. It was important to let the participant talk freely about a theme; however, the researcher also had questions related to the themes in the interview guide to ensure that all the relevant questions were included.

The interviews were performed in the Norwegian language, audio – taped and transcribed word by word in Norwegian. Furthermore, it was also important to maintain the confidentiality under the transcription of the interviews. To avoid misleading the participants to convey experience they may later regret, the researcher did transcribe all the interviews' and conduct the data in a cautious manner (Dahlberg et al. 2011, pp. 234-235). The participants were given the opportunity to read the finish transcription in order to give their final consent.

4.2.4 Data Analysis Methods

Analysing a phenomenology approach is to transform lived experience into a textual expression of its essence that reflects something meaningful (Van Manen 1990, p. 36). Moreover, the data obtained during the interviews were transcribed and analysed using content data analysis method.

Working with qualitative data, to answer the research question, requires the researcher to reflect, be creative, systematic and follow rigorous standards of empirical enquiry (Liamputtong and Serry 2013, p. 366). To attempt qualitative data analysis is an ongoing

process that involves the whole research according to Liamputtong and Serry (2013, p. 366). It directs that data is transcribed and transformed into summaries, coding of the data to identify preliminary themes, and therefore data reduction is a fluid process since analytical choices modifies themes and others emerge (Liamputtong and Serry 2013, p. 367).

Indeed, one can say that systematic analysis of text certainly dates back to the inquisitorial pursuits by the church in the 17th century (Krippendorff 2019, p. 10) at which stage it was used by journalists to analyse and criticise religious texts. However, it was not until World War 2 that the USA used this method to analyse Nazi propaganda and in 1952 Bernad Berelson provided the first integrate picture of the content analysing method according to Krippendorff (2019, pp. 10-17). From the very start this was a quantitative method and was grounded in a positivistic worldview but, has over time expanded to been used in qualitative studies (Graneheim and Lundman 2004).

The qualitative content analysis has its starting point in the naturalistic paradigm and there are different interpretation approaches of the reality where the studies goal is to investigate peoples lived experiences and its context (Graneheim et al. 2017). According to Neuendorf (2017, p. 34) content analysis encompasses all text that also analyses with a focus on written or transcribed words. Moreover, this data analysis was guided in a Gadamerian hermeneutical way, through the hermeneutic circle, as described by Austgard (2012). The hermeneutical circle was undertaken and catered for by listening to the interviews many times before the researcher transcribed the interviews that had been conducted. Furthermore, the transcribed interviews were read several times in order to get an overview of the text before being able to define the meaning units.

However, there are two approaches that can be used for analysis, an inductive or a deductive way (Elo and Kyngäs 2007). If the purpose of the study was to test a theory the deductive analysing method should be used, in a move from the general to the specific. Furthermore, in using an inductive approach the data moves from the specific to a general statement (Elo and Kyngäs 2007). However, there is also a possibility to use an abductive approach to have a more complete understanding that implies moving back and forth between deductive and inductive approaches (Graneheim et al. 2017). In the present study the analysis started with an inductive approach where meaning units were abstracted to codes and resulted in sub-themes and themes. Beyond this approach, the literature review

inspired a change to a deductive method by emerging the sub-themes and themes into the phases of disaster.

Analysing a phenomenology approach is to transform lived experience into a textual expression of its essence that reflect something meaningful (Van Manen 1990, p. 36). Personal interpretation was undertaken to have a deeper understanding of the participants meaning because a computer text analysing program gives little place for participants underlining meaning (Krippendorff 2019, pp.220-221).

There are two analytical techniques of using qualitative content analysis of a text;

(i) a manifest content, or

(ii) a latent content.

Manifest and latent analysis look at different aspects of the message according to Neuendorf (2017, p. 31). The manifest analysis examines the obvious and the straightforward aspect, in other words what the text says (Neuendorf 2017, p 31).

The latent analysis examines subtler aspects in the text. According to Neuendorf (2017, p32) referred to Berelson (1952) and Schreier (2012), the manifest analysis is more frequently used to find the meaning from quantitative data. Therefore, using a qualitative content analysis of the interviews, the focus is on the latent meaning of the text (Neuendorf 2017, p 32). However, Potter and Levine-Donnerstein (1999) delineated latent content into two types of latent content; "pattern "and "projective" (Neuendorf 2017, p 32). With pattern content, the focus is more on the patterns in the content itself, while projective content focus more on the meaning of the content (Neuendorf 2017, p 32). In order to find the meaning of the text, there is a need to be aware of that text based on interviews that are shaped within an interaction between the researcher and the participants according to Granheim and Lundman (2004). This can be seen as a communication act, that the message is communicated through text and the feeling that emerges from reading the text (Granheim and Lundman 2004). Since the aim of the present study is to investigate the phenomenon of Disaster nursing in Norway, talking to nurses and their leaders was important in order to reveal their experience of the phenomenon. To explore how the Disaster nurses' phenomenon was incorporated in the Norwegian nurses' education and work, interviews were undertaken. Furthermore, interviewing nurses and leaders in municipal rural areas enabled the researcher to obtain knowledge about the phenomenon related to nursing during difficult situations.

Qualitative content analysis is a method used in many nursing studies and it is suitable for analysing verbal, written and visual communication according to Elo and Kyngäs (2007). According to Morgan (1993), there has been controversy using the content analysis method to analyse textual data. The method used in qualitative research has been considered a simplistic technique and not sufficiently quantitative and later the method was considered not sufficiently qualitative (Morgan 1993). Today however, the content analysis method has an established position in nursing research (Elo and Kyngäs, 2007).

"The aim is to attain a condensed and broad description of the phenomenon, and the outcome of the analysis is concepts or categories describing the phenomenon." (Elo and Kyngäs 2007)

The present study used a latent content analysis process as shown in the Figure 4.2 and it was carried out as follows. The first step, decontextualization, is where the researcher read through to gain a grasp or an overview of the text to familiarise herself with the data to obtain the sense of the whole (Bengtsson 2016). In the beginning, the understanding of the text is a presumption according to Ricoeur (1976, p 174) therefore it is important to find "what is going on?" according to Bengtsson (2016). It also provides direction for further analysis of the text. Initially, the interviews were read several times to gain an overall understanding of the text before it was broken down into smaller meaning units. A meaning unit contains some of the insight the researcher needs to answer the research question (Graneheim and Lundman 2004). The meaning unit is a constellation of sentences or paragraphs containing aspects related to each other and each meaning unit is labelled with a code understood in relation to the context (Bengtsson 2016) see Table 4.4. According to Bengtsson (2016) codes can be generated inductively or deductively. A deductive design is when the researcher has created a coding list before analysing the text, whilst using an inductive design; the researcher creates the coding list during the analysing process (Bengtsson 2016). The present study is based on an abductive design (Graneheim and Lundman 2017), the researcher started out in an inductive manner with a coding list produced based on the pilot interview before analysing the remainder of the interviews. However, in the process of analysing the remaining interview texts, the researcher discovered new and unmarked text that needed to be included and coded.

Second step in the analysing process was the recontextualization, where the researcher checks if all aspects of the content have been involved based on the aim of the study. In

other words, the recontextualization process is to re-read the original text alongside the final list of meaning units to include important unmarked text (Bengtsson 2016). Furthermore, the aim of recontextualization is to include important information to the study that has not been identified and to let go of unimportant information that does not correspond with the aim of the study.

After the recontextualization we come to the third step, the categorisation, this is a process that is needed especially since the data is based on interview text and because latent content analysis was carried out (Bengtsson 2016). Firstly, the meaning units were condensed where the words were reduced without losing the meaning of the text, see Table 4.4. As Graneheim and Lundmann (2004) call this a condensed meanings unit as shown in Table 4.4, and then abstracted and labelled with a code.

Table 4.4 Examples of meaning units, condensed meaning units and codes Based on Graneheim and Lundman (2004) figure 1.

Meaning unit	Condensed meaning unit	Code
We (nurses) are in the process of making plans and we are divided into several teams. Some deal with wounds, some with cancer and some with the departments' preparedness plans (the home care part of the municipal health preparedness plan).	We (nurses) are involved making home care department part of health preparedness plan.	Knowledge of nurses involved in health preparedness plan

The categorisation process identifies themes and categories. This process can further be divided into sub-categories and sorted into broader categories (Bengtsson 2016). According to Graneheim and Lundmann (2004) before creating categories, the meaning units must be condensed to reduce the number of words without losing the meaning as shown in Figure 4.2 and Table 4.5. This process is determined by the depth of the meaning units, and it is subtle when data are based on interviews and the latent content analysis is

to be carried out (Graneheim and Lundmann 2004). In this categorisation process identifying themes and categories is outlined. However, after identified themes and categories there should not be any data that fall between two groups/ category nor fit into more than one (Krippendorff 2004; Graneheim and Lundman 2004). Furthermore, there is no consensus for which heading or concepts to be used in a content analysis (Bengtsson, 2016). Therefore, in the present study the heading sub-themes are used and this is the smallest units based on meaning units (Bengtsson, 2016). The concept of a theme has an underlying meaning on an interpretative latent level that answer the question "How?" (Graneheim and Lundman 2004). On the other hand, there are no informal ways to describe specific strategies to perform categorisation according to Bengtsson (2016). Furthermore, all categories must be based on the data from which they arise. With this in mind the researcher moved the meanings unit back and forth between categories to develop the category outcome. In this process, several categories are often generated and then the number was later reduced (Bengtsson 2016).

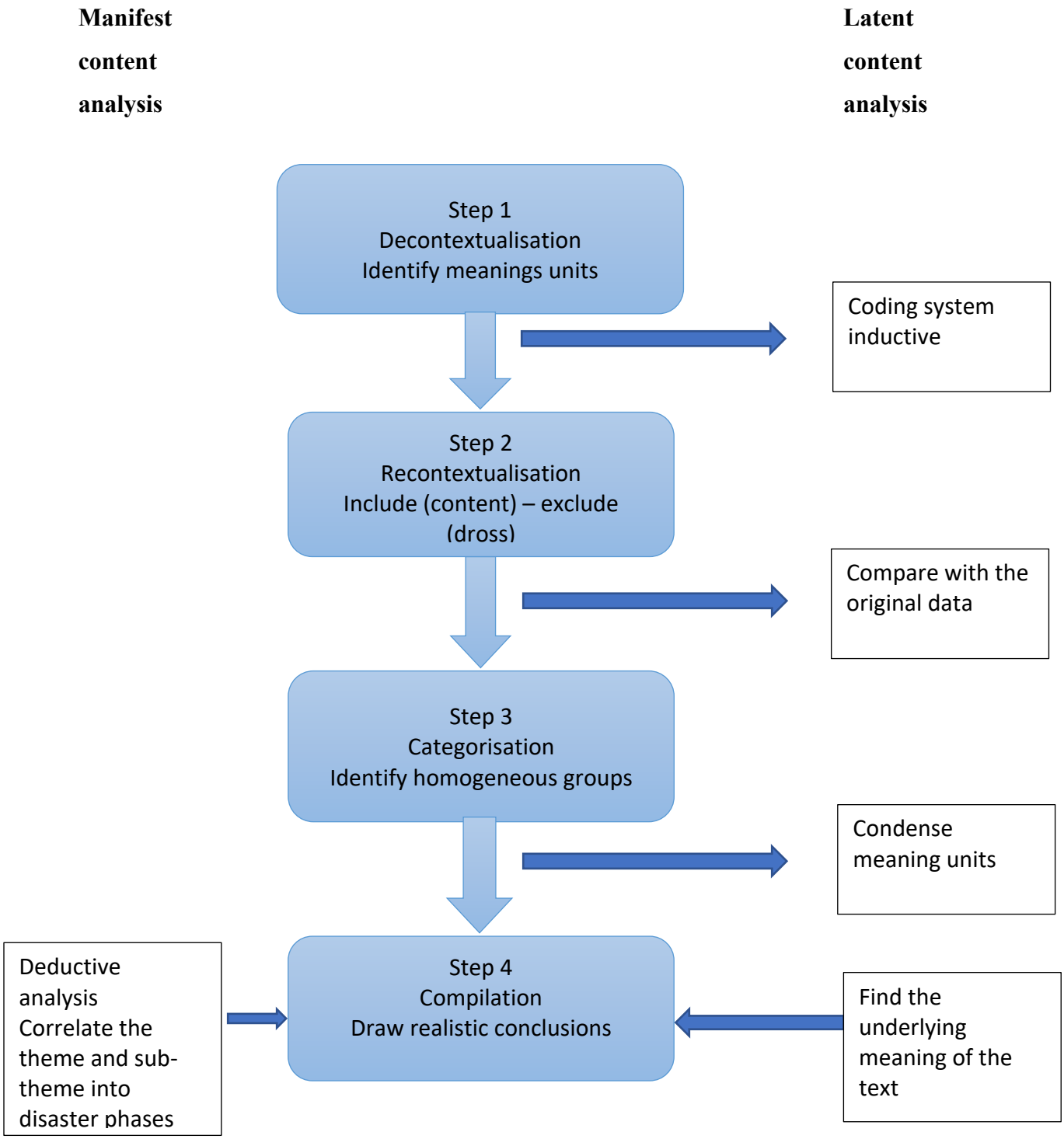
Finally, the fourth step which is the compilation, analysing and then the writing up process starts (Bengtsson, 2016), see Figure 4.2. In this step the researcher begins the process to find the meaning of the text, the informant's experiences, related to the disaster nursing phenomenon. The latent analysis of the text was performed by going through the themes and this gave the researcher the opportunity to go "deeper" into the text to identify hidden meanings (Bengtsson, 2016). Furthermore, the themes and sub-themes were chosen and the findings corresponded with the literature suggesting that the result is reasonable.

Table 4.5 Examples of the analysing process identify meaning units, condensed meaning units, sub-theme and themes extracted from the interview with a nurse (N3).

Condensed meaning unit, description close to the text	**Code**	**Sub-theme/ sub-category**	**Category**	**Theme**
No, very little in fact, I would like to know more about municipal preparedness plans.	Don't know of the municipal preparedness plan	Knowledge of municipal disaster management plan	Plans	Municipal disaster management plan
I don´t know if nurses have been involved in developing the plan.	No nurse's involvement in municipal preparedness plan	Nurses involvement in municipal disaster management plan		
No, very little in fact, I would like to know more about municipal preparedness plans.	Unfamiliar with the Health preparedness plan	Knowledge of the municipal health preparedness plan		Municipal health preparedness plans
We (nurses) are involved making home care department part of health preparedness plan.	Knowledge of nurses involved in health preparedness plan	Nurses involvement in municipal health preparedness plan		

Based on Graneheim and Lundmann (2004) Figure 2

Figure 4.2 Inductive content analysis process of the study based on Bengtsson (2016) Figure 1.



4.3 Ethical Considerations when Interviewing the Participants

This thesis has a qualitative approach with in-depth interviews and the goal with qualitative interviews is to obtain an understanding of the participants' life-world (Serry and Liamputtong 2013, p. 40). In terms of methodology, two types of data were collected. The first collection was a document survey of relevant Norwegian governmental documents, policies, acts and nursing educational curriculum as described in Chapter 2; sections 2.3.1 and 2.5. The second data collection is the interviews with a selection of Norwegian rural community health care nurses and the leaders of Norwegian rural community health care nurses.

The main form for collecting data for this study is the semi- structured interviews where the participants shared their story with feelings, opinions and knowledge, and includes direct quotations from their story (Dahlberg et al. 2011, p.203). Informed consent and recruitment of participants took place through a third person with the respective skills and disposition in order to avoid influence (Polit and Beck 2004, p. 56).

Before the interview the participants were provided with information, oral and in writing, about the purpose of the research study and that participation in the study was voluntary (Dahlberg et al. 2011, p. 202). Participants were also informed that sharing their experiences could expose other people, therefore it was important to have confidentiality in mind during the interview. Furthermore, participants were informed that they had the right to withdraw from any part of the interview if they felt uncomfortable. After the transcription, the written text was sent to the participants in order to read through the interview and to give their final consent. Care was taken to ensure valid consent and withdrawal procedure, confidentiality and anonymity of the data material, how the results would be published, who is responsible and who may be contacted (Dahlberg et al. 2011, pp. 202-203). All of the results are considered anonymous and will be published in a manner that will ensure that the results remain anonymous.

Since the researcher did have personal contact with participants during narrative interviews it was important to take an ethical approach "do no harm" throughout the whole process of research (Dahlberg et al 2011, p. 204).

A research ethics training course was successfully attended online and the ethics checklist was submitted and approved. The final permission to conduct this research was approved by Bournemouth University`s Research Ethics committee, no. 21912, and secured the University's research ethics procedures and processes for collecting and storing qualitative data.

4.4 Reliability

To ensure trustworthiness, the researcher needs to provide the reader with sufficient detail in order to enable the reader to assess the validity and credibility as proposed by Baxter and Jack (2008). Towards this end, the research question is clearly written and explained. Secondly, the case study design is appropriate to answer the research question. Thirdly, the collection of data is in a case study format. Lastly, the data was collected and managed systematically as well as analysed in a thorough manner. This approach is also as proposed by Baxter and Jack (2008). In another words, the research methodology should be very clear, safeguarding that a similar study would give a similar result. This will in other words ensure repeatability of the study. In this study, reliability has been considered by talking about and discussing the same theme, in different ways, with all the participants. Furthermore, listening to the recorded interviews several times before transcribing the interviews word by word, the participants read through the transcriptions and approved it before the analysis process was initiated. In order to understand the precise meaning of the participants' responses a thorough analysis was conducted in order to ascertain the meaning and logic of results.

4.5 Transferability

Transferability of a study to another context is always subject to debate. Case study theorist such as Yin (1994) takes a conventional view that a case study is only meaningful as a member of a sociological family of cases which provide the analytical framework to understand it. Stake (2010, p. 198) in contrast, argues from an interpretive perspective that case is meaningful in its own right because an experience has some element in it that is transferable to similar experiences. Stake exemplifies this with that 'greying of hair' influences what we expect in the future, an experience that can be generalised and transferred to similar situations and conditions. Although the transferability of results has

to be considered thoroughly in qualitative research in relation to contextual similarity (Koch 1996; Lincoln and Cuba 1985; Tobin and Begley 2004) the essential concepts synthesised in this thesis indicate areas of importance for all community and municipality health care services where nurses work and perhaps it could apply to other and different countries as well.

These factors should be considered when transferring the core message of this case study in arctic areas of rural northern Norway to other culture and settings. In-depth description of the sample and the research context may facilitate the readers´ evaluation as to whether any aspect of the phenomenon may be transferred to their own settings.

4.6 Validity

A main argument for case studies is that the researcher by virtue of extensive and detailed knowledge will achieve a high degree of validity. To study in the researchers, own field, which is the case for the present study, could bias and could lose important information. On the other hand, it could be an advantage, because the researcher understands the participants experience in a better way than somebody without any experience in the field. Since the researcher is a part of the world, it is an impossible goal to think that the researcher is absolutely objective (Dahlberg et al. 2011, pp 336). However, the results show that the findings are supported by other international studies. Even so Kvale (2001 p. 59) said that earlier study shows that even if few people have been involved in studies, the results have had important contribution to the common knowledge.

4.7 Limitations

The actual sample size consisted of 8 nurses and 8 leaders (all both leaders and nurses with a BSc Nursing background), in other words a total of 16 informants. The education and nursing together with leadership experience of the participants as well as their gender and present workplace and experience, are presented in Tables 4.2 and 4.3

This may appear to be a small sample; however, it must be seen in relation to the population of nurses in these sub-arctic regions who were investigated. A larger number of informants (N=30) were planned for, as outlined in Appendix 1, but it proved difficult to recruit this number of informants. To put this in perspective, Norway has a population of 4.33 million inhabitants, the north of Norway has a population of 484 546 inhabitants.

Given that graduate nurses working in nursing homes and home care in Norway per 1000 inhabitants is about 8, the total number from which the sample has been taken can be estimated as 218 nurses and nurses' leaders. Using Krippendorff (2019, p. 368), an expression for the sampling error is given as:

$$\epsilon = \frac{\sigma}{\sqrt{N}}\sqrt{\frac{n-N}{n-1}} = 0.025 \qquad (4.1)$$

Here n=population of nurses and leaders in northern Norway=(484546 / 1000) x 8
=3876

N=sample size =16

σ=standard deviation – homogenous sample=0.1

ϵ=sampling error

This size of error, 0.025 is also considered small by Krippendorff (2019 p. 368) and in other words, the estimate for the sampling error is very low due to the low number of inhabitants in these regions.

Finally, there could be some findings that are lost in translation from Norwegian to English. However, since the analysis was performed in Norwegian and that the citation from the condensed meaning units was translated into English, the participants meaning was important to keep as far as it was possible.

4.8 Concluding Remarks

The descriptions, techniques and analysis methods described in the present chapter form the basis for the interviews that yield the data in the next chapter. It is certain that whilst the region where the interviewees work is large and the weather conditions can be very harsh, Norway as such, is a comparatively prosperous country (Chapter 1) with a well-developed health service which should be able to further enhance its health and rescue service to demonstrate the way forward for Disaster Nursing. Consequently, this gives the data of the next chapter meaning in showing and demonstrating the future of disaster nursing.

Chapter 5

Empirical Results and Findings

5.0 Introduction

This chapter presents the key findings from the empirical research consisting of sixteen deep qualitative interviews with relevant stakeholders (eight interviews with nurses and eight interviews with nurses' leaders) based in the rural areas of sub-arctic northern Norway. As a reminder, the aim of the interviews was to uncover key results that will facilitate the ability of this study *to critically evaluate the present and future requirements of Disaster Nursing using rural northern Norway as a case study.* Furthermore, the findings presented in Chapter 5 will provide key foundations for later discussions of the validity and value added of the 'DN-ND conceptual framework' presented in Chapter 6 in the context of disaster nursing requirements for community nursing in Norway. The results will also provide the basis for later discussions in Chapter 6 in relation to the key research objectives and questions underpinning this thesis.

It is important to yet again consider the concept of a disaster and an emergency (see Chapter 1) in order to understand the requirements for Disaster Nursing. The definition of a disaster includes reference to: " *..which exceeds the ability of the affected community or society to cope using its own resources*." In contrast an emergency is referred to as: " *... happens suddenly or unexpectedly and needs fast action in order to avoid harmful results."* Incidents are often names given to an emergency followed by the name of the type of incident. An incident which could be an emergency might be sufficiently large to require the community to obtain outside help, thus the incident could potentially be termed a disaster. In rural, sparsely populated regions, available resources and facilities may be small in comparison to large urban areas with ample resources. Consequently, what health care staff and nurses might term a disaster in rural regions could be considered a smaller incident in an urban region because of available resources and facilities. The speed at which support can be obtained may also be lower in rural regions due to poor infrastructure, long distances and often unpredictable and severe weather conditions (see Chapter 1). It is with the above understanding in mind that the comments

and opinions in the interviews from the nurses and health care leaders should be considered and analysed. The Participant Information Sheet is given in Appendix 1 (page 240) whilst the Interview Guide - for Nurses is given in Appendix 2 (page 243) and the Interview Guide – for Leaders is presented in Appendix 3 (page 245).

5.1 Introduction of the Informants

The informants that participated in the study were both nurses and leaders. All the informants, the leaders as well as the nurses have an educational background as graduate nurses and their working experiences as nurse was from 1 year to 38 years. Due to the nature and location of this study, inclusion criteria were developed to ensure that the informants had relevant understanding and experience of the conditions that prevails and are relevant. Consequently, apart from that the informants should be graduate nurses, there was a focus on working experience in a rural, north Norwegian municipal health care department for both nurses and leaders. Based on similar reasoning, leaders should have a working experience in the rural north and several years as leader of nurses in north Norwegian rural municipal health care. The informant nurses should have more than 2 years of experience working within a municipal health service in northern Norway, whilst the leaders should have experience as a nurse in the municipal health service of northern Norway and several years' experience as leader for nurses within the municipal health service in northern Norway. The details of the participants in terms of gender, workplace and experience, as well as, education is presented in Tables 4.2 and 4.3 of Chapter 4.

5.2 Analysis of the Interviews

Analysis of the interviews was carried out using content analysis. Consequently, four categories were identified. Furthermore, nine underlying themes were also generated as shown and displayed in Table 5.1.

The four categories are as follows:
(1) Rural communities' health care mitigation and resilience**;**
(2) Rural municipal preparedness;
(3) Rural municipal response;
(4) Rural municipal recovery,

The above categories were aligned with the phases of disaster management (Chapter 2, Figure 2.6). Discussed in Chapter 1, a disaster can be divided into four phases; mitigation, preparedness, response, and recovery. In reality, these phases are interlinked and overlap each other. However, in the present study "resilience" has been introduced as a complimentary concept. Resilience presents as the nexus between the health care leaders` expectations of nurses' work and the challenges encountered by frontline staff. Figure 5.1 demonstrates the relationship between the four categories of disaster nursing and the phases of disaster management.

Figure 5.1 Disaster nursing categories aligned with phases of disaster management

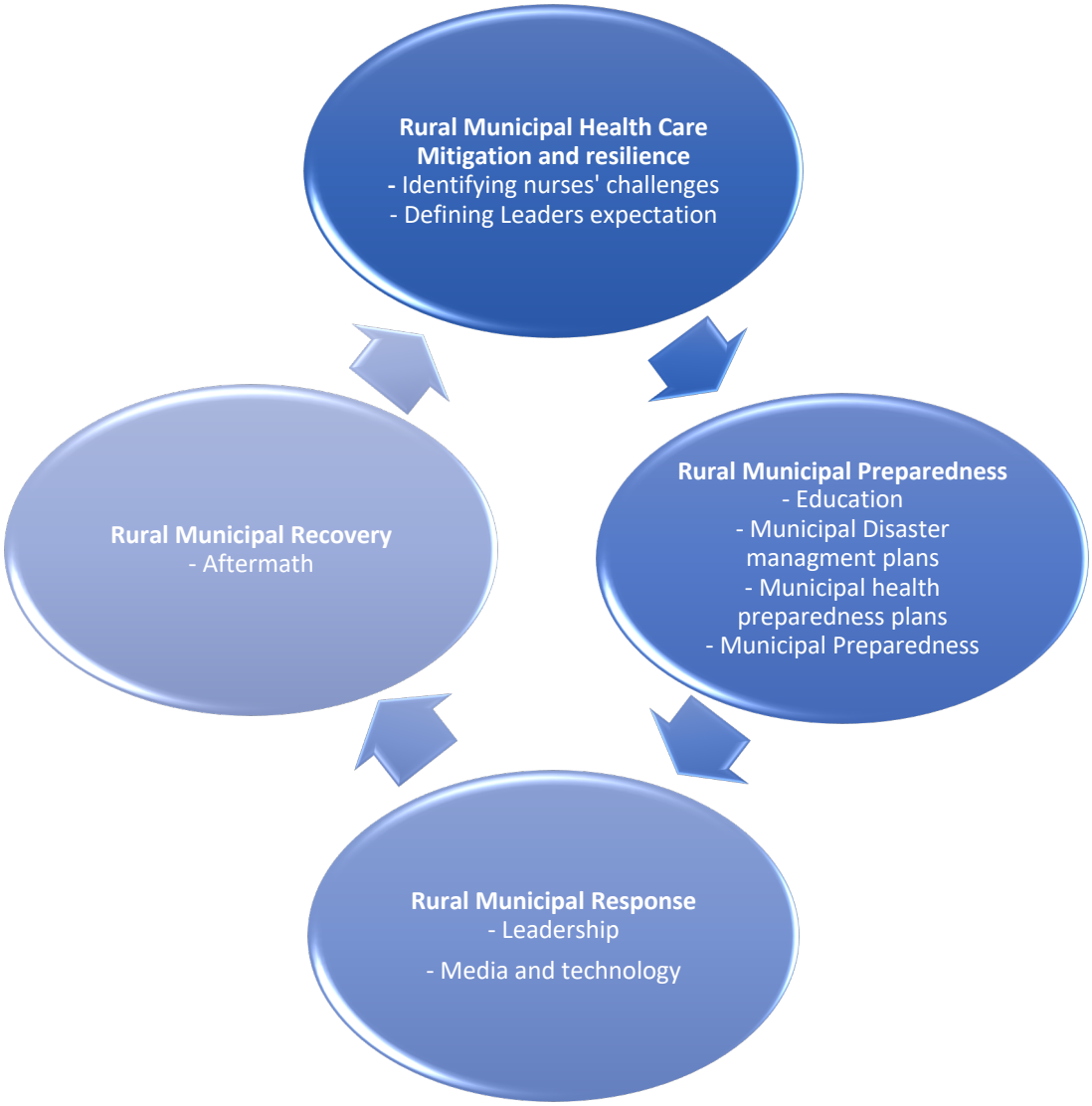


Table 5.1 Overview of the thesis Categories, Themes and Sub-themes.

Category	Theme	Sub-theme
Rural communities' health care mitigation and resilience	Nursing challenges working in rural communities that could affect working in a disaster**.**	Nurses` daily working challenges that could affect the nurses' emergency response
		Nurses` perception of the municipal local Government knowledge of their work.
	Leaders` expectation of nurses work in emergency or a disaster situation	Expectation of nurses in crisis situations
		Leaders` expectation of nurses to be professional
Rural municipal preparedness	Disaster nursing topics in Norwegian nursing education	
	Rural Municipal disaster management plan	Knowledge of the municipal disaster management plan
		Nurses involvement in municipal disaster management plan
	Rural Municipal health preparedness plans	Knowledge of the municipal health preparedness plan
		Nurses involvement in municipal health preparedness plan
	Rural municipal health care preparedness	Rural municipal facilities for disaster exercise
		Rural municipal health units facilities for emergency training
		Rural municipal medical store and equipment prepared for emergency situations
Rural municipal response	Nurse's leadership in disaster	Nurse's leadership will have an effect on nursing in emergency and disaster situations
	Use of media and technology in crisis	Nurses and leaders view of handling media in health care disasters
		Using social media as an information channel in emergency situations
		Using technology in health care disaster
Rural municipal recovery	Nursing in the aftermath	

5.3 Understanding Mitigation: State of the Rural Communities' Health Care Resilience

A central part of successful disaster mitigation is developing an understanding of the latent resilience of a community which is often instrumental in dealing with a possible future disaster. If leaders and management do not fully understand a nurse's work in the municipal health care system, this often leads to deficiencies in levels of local Government funding and resourcing, which ultimately influences the effectiveness of preparedness, response and even recovery. In short, overall municipal resilience will be detrimentally and negatively affected. Furthermore, if the expectation of the nurses by health care leaders were/are not in accordance with the nurses' understanding of their work, this prevailing asymmetry can lead to critical gaps in awareness and mitigation, and thereby constitute a risk to overall and effective resilience in health care disaster situations. This category links to awareness of mitigation to foundations of the rural municipal resilience in a disaster phase (see the disaster management cycle in Chapter1, Figure 1.2).

5.3.1 Nurses Challenges working in Rural Communities that could affect their Work in Disaster

Two main challenges were identified in the nurses' cohort of interviewees (Nurses Group 1 – NG1). First, the primary challenge identified by nurses in the context of mitigation linked to specific concerns relating to the geographical and communal isolation of rural communities that constrains supportive infrastructure and therefore affects and often impedes nurses' emergency response. The second challenge identified by nurses, corresponded to concerns over what could be called 'cohesive and integrated awareness'; more specifically, concerns over a lack of integration and cohesiveness between nurses' practical challenges, health care leaders' expectation and local Government or municipal knowledge regarding disaster management and funding. Hence in spite of the existence of Government guidelines relating to disaster preparedness plans (see Chapter 2, sections 2.5 and 2.6), the nurses often cited that there were critical gaps and a lack of synergy in terms of general understanding of mitigation. Furthermore, it is also reinforced by the literature review that showed that yearly surveys and reviews revealed that not all municipalities update their plans. Indeed, it is only in recent years, that health preparedness plans have been proposed for the rural communities of Norway.

The results for nurses (NG1) also revealed that the infrastructural realities of the rural health care systems placed important operational constraints that nurses often cited needed to be at the forefront when developing mitigation strategies for disasters and understanding levels of latent resilience. The nurses own experience is exemplified by the comments of N7:

"...we have patients here for a much longer time than other places where the hospital is nearer because we have to wait for the aircraft transportation and special competences from outside the municipality" (N7).

These operational constraints and realities were often referred to by nurses (NG1) as rationales for stronger awareness of nurses in mitigation strategies. They viewed the role of nurses as having greater importance precisely because of the logistical challenges associated with community nursing in the remote rural communities. The consensus among the nurses is that their work in the rural municipal healthcare system is important because there is, in general, a long distance to the nearest hospital and a relatively low number of doctors. Distances of several hundred kilometres (Km) are not uncommon (as discussed in Chapters 1 and 2). Since nurses may be the ones that often possess the highest degree of understanding of health care knowledge at work, they argue that they should equally have sufficient recognition and oversee large responsibilities, especially in relation to emergency and disaster situations.

One illustrative example was given by a nurse who is working at a cottage hospital where they have to stabilise severely ill patients while waiting, frequently for prolonged periods, for the medical specialists to arrive and at the same time this nurse is also responsible for a hospital ward. Rural municipalities in the north of Norway cover large geographical areas, and there could be long distances between patients' homes and consequently there was a concern among some of the home care nurses that they may not reach out to all their patients in a disaster. It was agreed among the nurses that working in the rural municipal health care system was challenging and the problems they have to solve during normal situations will be exacerbated in a disaster situation. A variety of perspectives were expressed and lack of resources was one challenge put forward by several nurses. Yet, there was diversity in the kind of resources that were considered as possible shortage potentials in a crisis or a disaster situation. For example, it is very surprising that the nurse

working in the cottage hospital was concerned about having adequate equipment, such as beds, to be prepared for a disaster situation. The findings show that some of the nurses were concerned that the municipality was unprepared to manage the lack of educated health care personnel in a disaster situation. Lack of knowledge among the staff could put patients' safety at risk and it could also reduce the municipal resilience. At the cottage hospital the expectation of the nurses' competence and experience needs to be "high" in order to deal with their requirements. Consequently, they do not employ recently educated nurses, this is in stark contrast to rural nursing homes where staff employed without formal health care competence is normal.

"Sometimes the resources (number of staff) are marginal, so it is a matter of managing the work with the resources we have" (N1).

However, some of the nurses felt that they were not prepared to take control as a first responder, while others considered that they will act and do their best in a disaster situation. *"…. don't let feelings take control in an emergency situation, act and think afterwards"* (N2).

This result indicates that the consensus across the nursing interviewees (NG1) was that there was clearly a demand for further training and education to raise competencies for dealing with disasters – providing clear evidence for a receptiveness to discuss disaster nursing and/or nursing in disaster profiles (see further discussion in Chapter 6). It also provides evidence that the situation in municipal nursing in Norway has similarities to that expressed in the identification (Stage 1) of the 'DN-ND conceptual framework' (see Chapter 3, Section 3.2, Figure 3.1).

The nurses' cohort (NG1) also highlighted that mitigation strategies need to also be aware of the differing challenges faced by nurses across the community nursing portfolio. Several interviewees emphasised that there was a major difference between nursing in an institution and nursing in home care in terms of the number of patients that staff have to deal with; there were major differences in staff-patient ratios that affected mitigation and general resilience levels in community nursing in rural communities in Norway. Overall, the main challenges that home care nurses talked about was that there are no limits to the numbers of patients that the home care services have to deal with, since everyone in need has by law the right to receive home care as part of a local municipality (Chapter 2,

Section 2.5 and 2.6). Several of the home care nurses felt that this fact was not taken seriously by the municipality or local government, it was never reflected in the funding and consequently it will have an effect on the home care nurses ability to perform nursing in a disaster situation. There was a fear among the home care nurses of how they should manage the practical challenges they would have to deal with. Primarily they have to take care of their main patients plus they will have an emergency preparedness role, something that is very different from their normal daily work. Two divergent and often conflicting directions of the discussions emerged:

1) Providing assistance in a way that home care nurses have not been prepared for;
2) Simultaneously care for patients with special problems that the home care nurses do not feel competent to deal with.

Concerns were also expressed by nurses that existing mitigation was also not sufficiently advanced as to understand the nuances of the new challenges affecting the rural communities. One home care nurse expressed her fear that the rural municipal health care system was not ready to care sufficiently well for those inhabitants who had escaped from war or other disasters (refugees). Her feeling was that many of these people have had experiences that affected them in a way that could make it challenging for the nurses to deal with their work.

… There are more and more refugees arriving and there will be challenges with respect to language and to people with "a dark and heavy luggage" (N3).

She was afraid that the "luggage" these refugees have with them could appear stronger or heavier in an event that would trigger this experience, such as in a disaster situation. Another nurse talked about how varied the patients` situations that they need to work with could be. She remembered a situation where an old man with a gun was threatening the night nurse. Since this nurse also had an education in psychology, on their request she accompanied the police to the patient's home to calm down the situation. How the nurse dealt with the challenges shows that nurses have the ability to meet unexpected situations and this is positively related to be prepared for nursing in disasters. Interestingly, none of the nurses thought that the local Government fully understood the importance of their

work, not in sufficient detail anyway. These views surfaced mainly in what was expected of them and the lack of recognition of how stressful emergency situations are for nurses.

"Because, we have many and different work tasks and we often have to be in difficult and pressed situations…they (the local Government) know what we are doing, but I don't believe that they really understand how demanding or how stressful it can be in some situations" (N7).

Overall, these results also verify that there is a strong receptiveness to enhance disaster management skills among nurses as outlined by the DN-ND framework and support the potential for both DN and ND routes (see Chapter 3, Section 3.2).

Additionally, several nurses also expressed that the limited awareness of the importance of nursing and nursing perspectives in mitigation was enhanced by deficiencies in communication and dialogue. The local municipal leaders lack of feedback on nurses' work represents 'a communication problem' (N6) that may be influential upon levels of municipal resilience since nurses in the rural municipality often are those immediately available in the frontline. This communication problem was also cited by and raised by nurses working in home care:

"……whatever the challenges are, we have to be there when required. We work alone and independently, often without the necessary tools ... if we think about the administration, I don't think they understand our work. If it had been up to me, I would have liked them to join us for a working day" (N6).

Another home care nurse expressed the municipal leader's lack of feedback in this way:

"We see from year to year a reduction in budget and less staff, whilst we actually need more and more, during the recent years we have received less and less finances" (N5).

The asymmetry in profiles on communication issues was emphasised by the divergent responses in the results from the interviews with the leaders (Leader Group 2 – LG2). Health care leaders – in contrast - expected that nurses are professionals and already possess competence to carry out their job in emergency situations. *".. I expect that they are able to change the situation they are in….be professional"* (L2). Surprisingly, only three of the health care leaders expressed comparable expectations that correlated with what the nurses put forward as a challenge that they could control in terms of:

a) Having an overview over the situation;
b) Being professional; and
c) Keeping calm, (Table 5.2.).

Another important finding is the gap between what the health care leaders expect and what the nurses saw as challenges that would affect the municipal resilience. This correlated to a gap regardless of whether the discussion pertains to disaster nurses (DN) or nursing in disasters (ND) (see Chapter 3, Section 3.2). There is a certain amount of medical equipment and drugs based on normal use in stock in the rural communities. However, in an emergency or disaster situation the demand will rise and might become an issue. This will have an impact on requirement of nurses and their ability to perform their work and this is discussed with reference to education and other literature in Chapter 6.

5.3.2 Leaders Expectation of Nurses' Work in Emergency or a Disaster Situation

The health care leaders' expectation of the nurses varied widely from skills in basic fundamentals and ability to use their expertise, perform triage, prioritise and delegate, to have knowledge of the systems and the routines.[35] Contrary to this expectation, the study shows that some of the nurses felt that they were not prepared to take control, although for registration as a nurse there is an obligation for Continuous Professional Development (CPD). Nurses not being prepared to take control coincides with Stage 1 of the DN-ND conceptual model in as much as the nurses demonstrate an awareness or identifies a need to expand their competences. Nevertheless, at places of work it is the responsibility of their managers to authorise professional development, consequently, it is leaders that will be influential in activating professional development in terms of any future Disaster Nurse (DN) or Nursing in Disaster (ND) education. However, one health care leader clarified that she expects the nurses to know their professional limits and if not, ask for supervision. "*Moreover, it is important that they know their limits and ask for supervision…"* (L2). The statement by (L2) also suggests that the leaders would want to advise the nurses on the type of route they should follow in terms of asking for supervision. A health care leader of a municipal home care unit expected that nurses are able to carry out their work also in situations like disasters. This leader's expectation was very clear concerning the

[35] The health care leaders' expectations were primarily focused on knowledge application.

fact that when nurses have the opportunity, they should participate in training and theoretical courses.

"…*I also expect that the person will be professional in return, have knowledge of the systems and the routines we have"* (L2) .

Another health care leader who is leading a rehabilitation unit put forward the expectation of nurses to have knowledge about the municipal crisis plans and that they can care for all the population who are in crisis. She exemplified this by talking about a situation where the health care unit was quite new and the personnel who were on duty, were not familiar with the units' role in a disaster situation. An emergency occurred where an aeroplane had crashed, and staff from the hospital made phone calls and required the unit to prepare for receiving patients from the hospital. Nurses on duty were not aware of the rehabilitation unit's role in the municipal health preparedness plan and the plan for moving patients between the hospital and the municipal health care system. *"My expectation of nurses is that the nurses have knowledge of the municipal crisis plans..."* (L6).

The expectation and statement by (L6) are in agreement with the conceptual indicators for both DN and ND as given by Table 3.2 of Chapter 3 and corroborate thus the DN-ND conceptual framework. Other health care leaders expected nurses to work as professionals, care for people exposed to traumatic situations and be able to map patient's physical and mental needs as well as reporting the inhabitants need to the correct department. Interestingly, one health care leader expected nurses to be able to be a collaborative partner and support her (the leader); ".. *Thinking together and taking responsibility and see what we can do to reach the goal"* (L5).

Again, this statement by the health care leader also concurs with the DN-ND conceptual framework. Nurses` ability to collaborate was also expected by the head of a municipal health care department, however, this was collaboration with other health care personnel and first responders. Furthermore, she also expected nurses to be clear in their message in order to secure that every part of the services is functioning. Several other health care leaders were concerned about the effect a disaster could have on the population's mental health and believed that nurses were able to discover these problems. Not surprisingly,

the health care leader of the municipal crisis team expected that nurses knew when to contact the team in a disaster situation and that nurses are able to determine the need for help in the aftermath.

While nurses were concerned about having sufficient resources in crisis times, some of the health care leaders expected that nurses in disaster situations will use the resources sparingly such as medical equipment in order for it to last longer. "*....use the resources carefully so they last until new resources arrive"* (L2). Another health care leader (L4) had similar comments, but with a focus on the human resources. She did have a plan of how to manage and secure the nursing home nurses by coordinating resources over time in order to have refreshed nurses at work twenty-four-hours a day. Other health care leaders would call in nurses to have adequate numbers of health care staff to meet the health care demand. Surprisingly, none of the leaders talked about shortage of health care staff in the manner that nurses did (N1, N6) which demonstrates the need for the proposed DN-ND framework.

It is very unexpected that only one health care leader, the only interviewee of both cohorts (NG1 and LG2), a head of a municipal health care department (L2), was the only person who brought up the importance of ethical consciousness among nurses working in a disaster situation. *"….. They need to have an ethical consciousness and an ethical standard with them in all the things they do"* (L2)

However, one health care leader of a nursing home unit did not think that the nurses would be able to nurse in a disaster. *"I don't think they are sufficiently prepared for the task"* (L8).

5.3.3 Summary

The nurses view of their work in the rural municipality and the leaders' expectations of nurses to work in a disaster has been exposed. One important finding is that the majority of nurses do not have confidence that the top leaders fully understand their work and the extent of their work. There is clear evidencing within the NG1 interviews that there is a receptiveness towards addressing these issues as envisaged in Stage 1 of the DN-ND conceptual framework (see Chapter 3, Section 3.2).

The results further reveal that there are symmetries among nurses (NG1) and leaders' (LG2) views that mitigation needs to show more nuanced awareness of the differences across community provision; especially in that there are no set limits to the number of patients in home care and that this could be a challenge in a health care disaster situation. There is thus clear evidence of selective synergies where both nurses and leaders believe further progress can be made.

Nevertheless, there are also clear differences and asymmetries between nurses and leaders in terms of mitigation and general resilience. More specifically, there is a clear asymmetry between the expectations of the leaders and the challenges that the nurses envisage, which may have an effect on the mitigation strategies and the overall resilience of the health care in a municipality. This is a critical gap and something that needs to be addressed if general resilience levels are to be further enhanced. An example, as seen from Table 5.2 in Chapter 5, makes it clear that whilst the nurses express concern about insufficient education in emergency triage, the leaders expect them to be able to perform emergency triage. All asymmetries and symmetries from this category are presented in Chapter 5, Table 5.2.

Table 5.2 Challenges that could affect nursing in a health care disaster and leaders' expectation of nurses in a health care disaster.

Nurse	Challenges	Symmetry/ Asymmetry	Leader	Expectation
N1	-lack of triage knowledge	Asymmetry	**L2**	-perform triage
N1,	-lack of staff with nursing competence	Asymmetry	**L2**	- prioritise, delegate and be professional
N6	-get hold of enough health care workers		**L6**	knowledge of the municipal health preparedness plans
			L3	- knowledge of the systems and the routines
N2	-don't let feelings take control in an emergency situation, act and think afterwards.	Symmetry	**L2** **L3** **L5**	- have an overview over the situation - be professional - keep calm
N3	- lack of resources	Asymmetry	**L2**	- use the resources carefully so they last until new resources arrive.
N3, **N4**	- no limits to numbers of patients - double work in emergency situation	Asymmetry	**L2**	-have an overview over the situation - are able to change the situation
N3	-understand patients from different cultures and with another language	Asymmetry	**L2**	-know their limits and ask for supervision
			L1	- care for people exposed to traumatic Situation
			L1	-ability to determine the need for help in the aftermath
			L1	- mapping both physical and mental needs
			L7	-nurses ability to know when to contact the psychological crisis team
N4	-may not reach all our patients in a disaster	Asymmetry	**L2**	- prioritise, delegate and be professional.
	-a more acute role then we are used to	Asymmetry	**L3**	- participate in courses and training for emergency situations
N5	-not use to that kind of emergency work	Asymmetry	**L3**	- participate in courses and training for emergency situations
N6	-provide assistance in a way that we have not prepared for	Asymmetry Symmetry	**L2** **L8**	-are able to change the situation I don't think they are sufficiently prepared
N7	-large responsibility		**L4** **L2**	- use their expertise - know their limits and ask for supervision
N8	-be able to take control and lead	Asymmetry	**L4** **L4, L3, L5** **L5**	- use their expertise - work as a professional, professional competences - be cooperation partners
N7	-sufficient equipment	No comment		
		No comment	**L1**	- report the inhabitants need to the correct department
		No comment	**L2**	- basic nursing knowledge - communicate - ethical consciousness and an ethical standard
		No comment	**L4**	- meet up

The table shows in the second column the nurses` view of specific challenges in their daily work that could be worse in a health care disaster. The next column shows if there are symmetry asymmetry or no comment between nurses' challenges and leaders' expectation. The final column displays what the leaders expect from nurses in a disaster.

5.4 Rural Communities' Health Care Preparedness

This section considers selected results in relation to preparedness issues. Several questions provide input to this section. A strong prevailing emphasis across the interviews related to the role of education in enhancing preparedness. The participants gave their views on the need for covering disaster topics in the education of nurses since education of staff is a factor in preparedness. Furthermore, one question exposed data where participants explained how work experience could be used in education whilst in addition knowledge and involvement of municipal disaster plans were exposed.

5.4.1 Disaster Nursing Topics in Norwegian Nursing Education

The fundamental education for Nurses in Norway is a BSc (based on the Bologna model) (see Chapter 2, Section 2.3.1). Existing practice is to provide a general education for Nurses rather than a specialisation and includes 18 months of practise. However, there were no disaster topics in the Norwegian nursing educational program revealed by the literature review (Chapter 2, Section 2.3.1). However, a key result from this study is that there exists a strong consensus among the participants supporting the necessity for disaster and advanced emergency topics to be incorporated into the nursing education degree program, Table 5.3. (This seems to provide strong evidencing for an enhanced Nursing in/for Disasters (ND) route as envisaged by the 'DN-ND' Framework at the very least). The lack of nurses' involvement in developing or reviewing municipal preparedness plans may reflect the participants' knowledge (or lack of knowledge) of these plans. This section also demonstrates the nurses and health care leaders experience with training for crises and their involvement in a larger exercise within the community. Overall, the view was that exercising around disaster topics should be included in the nursing education syllabus also. This category links to municipal preparedness.

Significantly, none of the nurses (NG1) could remember having studied a disaster related nursing topic during their nursing education as seen from Table 5.3, and this is also supported by the BSc syllabus in section 2.3.1. Lack of disaster nursing knowledge among the nurses makes them appreciate the need for such topics in the nursing education syllabus. All (100%) of the nurses agreed that it is essential for nurses to obtain education and training in such topics. Interestingly, there were differences among the nurses concerning at what stage of the education this should take place. Surprisingly, two of the

nurses did not think that a disaster topic should be part of the basic nursing education (BSc level), but that rather it should be part of a more specialised post graduate qualification. One of the nursing cohort (NG1) was of the opinion that it should be a post graduate course with access for all nurses (N4). This respondent thought that a post graduate degree, such as a MSc is too long (2 years) and would not suite all nurses, therefore a shorter post graduate disaster training course should be offered. The other nurse felt that this topic needed more specialism and should therefore be part of a post graduate degree education. Both of these viewpoints could be construed as showing affinities with and limited support for the need for recognition of the more specialist nature of Disaster Nursing as envisaged in the DN route of the DN-framework.

One of the nurses' group (NG1) was concerned with the fact that nursing is a practical profession and that disaster topics would be a very useful inclusion. This nurse criticised the present nursing education as she felt that the education has more focus on nursing philosophy rather than the practical knowledge. However, she was aware of the many requirements of the syllabus so she was not certain of the amount required of a disaster topic, she said:

"The nursing education today is more concerned with nursing philosophy .... well, this is put somewhat bluntly, but nursing is a practical profession and we are not ready for disasters ..... But it is a matter of how much emphasis there should be on a disaster scenario compared to the daily knowledge" (N1).

The additional education and modernising of the present-day nursing syllabus was also criticised by another participant. This nurse was of the opinion that the practical was tied in with modern technology, and that the ethical education had not been able to follow up this change in the nursing working environment. She thought that there was a need for modernising the ethical guideline, and her view was as follows:

"We receive many more technological devices that make our work more efficient. But there is nothing that can replace a warm hand that can touch a cheek" (N2).

In fact, six of the eight nurses were of the opinion that more practical aspects of modern nursing should be part of a syllabus for disaster nursing and/or nursing in/for disaster. This suggests that whether the DN or ND routes are followed, then both need to be embedded with practical elements that bring out the synergies with the requirements and

ethos of modern nursing. However, there were differences of opinion about which part of the practical work should be emphasised. Whilst one nurse suggested more training in the use of new technology, another nurse suggested more about triage and dealing with severely injured patients:

"Learn more about triage and stabilisation of injured patients. I would like to learn more about for example car accidents or what do I do in a bus accident? But I would like to learn more about this. I think we need both: more simulation in the basic education not only theory about heart attack" (N3).

Notwithstanding, the remainder of respondents agreed that it is essential for nurses to learn more about nursing in a disaster. Two of these nurses felt that this topic should be taught during the initial part of nursing education. One expressed the view that nursing is a practical profession and therefore it is important to have knowledge about disasters. Furthermore, this nurse thought the municipality should be responsible for the education of their nurses to the level that they are able to do their work. Therefore, education and training in disaster topics should be the municipality's responsibility, but in collaboration with a university to provide courses for nurses.

"…, if I should be called out to a disaster, I don't think I need a post graduate degree or a masters to be prepared… I think… a collaboration between the university and the municipality to develop plans and relevant courses" (N4).

Nevertheless, there were differences of opinion about which part of the practical work should be emphasised. Whilst one nurse suggested more training in the use of new technology, another nurse proposed to learn more about triage and prioritising, together with learning about ethics related to such situations. Issues when dealing with severely injured patients was also considered important such as knowledge about trauma and advanced first aid. In these northern regions it was also deemed important to be able to handle frost damage and risk of infection. This to some extent coincides with nurses who would like students to learn more about first response medicine as practised by paramedics in incidents such as car and bus accidents. The above suggestions could be part of exercises that could be taught in the simulation classes. Indeed, it was emphasised by the interviewees with nurses (NG1) that simulation aspects should be emphasised in the future. Simulation of a disaster scenario was suggested by some of the nurses who would like more simulation in the basic nursing education in order to prepare students to

be able to manage their work in an emergency. An overview of the issues mentioned above are:

(1) Soft skills development,
(2) Use of new technology,
(3) Knowledge updating,
(4) Inclusion of new training provisions such as all the present-day kinds of simulation.

A further option was the possibility of taking the disaster subject into an existing post graduate degree in emergency nursing. *"...merging nursing for disaster with the post graduate degree in emergency nursing"* (N5).

A post graduate degree in disaster nursing topics was underlined by several of the nurses and one nurse was very clear about the need for more advanced first aid.

"I think that much has changed since I graduated ...we see an increased demand in preparedness.... especially since nurses also have a leading role.... I think there is a need for a post graduate degree" (N7).

Whilst the above comments focus more on the practical side of being in the front line of a disaster and how this should be part of the nursing education syllabus, several of the nurses also saw the need for other skills such as management and leadership in a disaster situation. This focus on the practical side of nursing is not only interesting, but demonstrates and helps to identify what disaster nursing (DN) should include in terms of syllabus and how it might be different from now (Nursing in Disaster - ND) as also discussed in Chapter 6 section 6.1.2 and 6.4. Furthermore, 37.5% of the NG1 cohort of nurses suggested the importance of leadership training and subjects in order to work in disasters and they proposed that this needs to be included in any future education requirements. This is also discussed further in Chapter 6 section 6.3.

Management and leadership skills were also proposed by the health care leaders (LG2), as five of the eight health care leaders were clear about that there is a need for more management/ leadership education for nurses in general practise and specifically for nursing in emergency/disasters as further discussed in Chapter 6, Sections 6.3 and 6.5. One health care leader had stronger views pointing to the issue that nurses should be able to give holistic leadership and that education in management and psychology should

reflect that. At face value, there seemed to be evidence for strong support for leadership training to be enhanced and the potential foundation for leadership routes akin to the DN route of the 'DN-ND conceptual framework' (see Chapter 3) as pointed out in Chapter 6, Section 6.5 when the need for and necessity of further Disaster Management education and training is highlighted.

The majority of health care leaders (LG2) recognised the need for disaster topics in nursing education although there were differences in opinion about where this ought to be placed within the syllabus. Six (75%) of the health care leaders thought that the topic should be in basic nursing education and four (50%) thought more suitable as a postgraduate degree. This provides some evidencing for levels of support for attributes outlined in both the ND and DN routes of the 'DN-ND' Conceptual Framework (see Chapter 3). Another important finding was that the head of a municipal health department wanted to expand the basic nursing education from three to four years with the last year including more specialisation such as disaster nursing; demonstrating at least a basic preference to at least extend Nursing in/for Disaster (ND) trajectories.

"*We need more municipal nurses specialising in emergency topics, because the number of ambulances has been reduced. Therefore, we see an increased need of our home care nurses to be first responders at an emergency scene"* (L1).

This trend, of increased need of home care nurses to be first responders at an emergency scene is a further and different, but supporting driver for at least the ND route of the 'DN-ND' Conceptual Framework. Increasing the duration of the nurses' basic (BSc) education was also suggested and to include teaching of emergency medicine for nurses dealing with disasters. None of the leaders saw any topics in present day education that should be omitted. *"...I think it must either be a post graduate degree education or a master to include the specialisation"* (L4).

Another health care leader thought that disaster nursing needs to be a speciality and that there should be several nurses experienced in disaster within a community in order to have a disaster nursing professional network. This comment by this leader suggested that Disaster Nursing was considered as a vocation with its specific skills sets and dedication.

Self- confidence and the building of confidence in nurses is an important issue according to a health care leader, leading a rehabilitation unit. She thought that nurses' self-confidence and confidence in their work as a nurse is important especially in disaster situations.

"I think that it is important that the students are conscious of themselves and that they could see themselves handling a crisis and the emotions that will take place" (L6).

Using simulation in practical training for disasters to visualise disaster scenarios would strengthen the nursing students' self- confidence.

Another health care leader expressed the view that collaboration with other health professionals is of great importance, as well as the understanding of reactions in different cultures when it comes to psychological issues such as trauma. Therefore, she highlighted that nursing students should be taught to give information to people in crisis, learn to keep calm and collaborate with other health profession such as doctors. This leader also mentioned that students need to learn about cultural differences when it comes to reactions of trauma.

One health care leader mentioned that disasters can give physical as well as mental health problems that nurses will have to deal with, and it should be a subject that nurses needed to learn more about. This is a large subject area which covers psychological effects on professionals as well as victims and the different types of effects that can be experienced from the various kinds of natural disasters to epidemics such as Spanish Flu and Ebola.

Table 5.3 The nurses and leaders view on emergency and disaster topics in a nursing education

Nurse	Topics	Education level	Leader	Topics	Education level
N1	Terror, mass casualty event, disaster scenarios, triage, more advanced first aid. Have not had DN topic in her own education	Bachelor nursing education	**L1**	All types of emergency medicine and more specialising disaster topic for nurses. Have not had DN topic in her own education	Bachelor in nursing and postgraduate education
N2	Triage, ethics, observation training Have not had DN topic in her own education	Bachelor in nursing education and postgraduate education	**L2**	Leading, more training and knowledge about trauma and emergency, more scenarios, disaster preparedness, disasters, developing plans and practice the plan in exercises Have not had DN topic in her own education	Bachelor in nursing and postgraduate education
N3	Triage, stabilising a patient, avalanche first aid, drowning, mass casualty events, more simulation and cooperation with other first responders. Have not had DN topic in her own education	Bachelor in nursing education and postgraduate education	**L3**	More focus on nurses` leadership Have not had DN topic in her own education	Bachelor in nursing and postgraduate education
N4	First aid, knowing plans, refreshing course, Have not had DN topic in her own education	Course	**L4**	Specialisation in acute medicine and leadership Have not had DN topic in her own education	Postgraduate education or a master
N5	Leading at the emergency scene, emergency nursing and medicine, communication also using internet, evacuation, cooperation, how to handle the communication section. Have not had DN topic in her own education	Emergency disaster topic into the present post graduate degree in emergency	**L5**	This has to be a specialisation in nursing for people with for instant frost damage, how to get hold of the equipment? who can be involved? and where you can find information? Have not had DN topic in her own education	Postgraduate education
N6	Preparedness, disaster and crisis plans, practise training Have not had DN topic in her own education	Bachelor in nursing	**L6**	Students should practice (simulation) nursing in crisis to meet the feeling that will occur so they know themselves better. Have not had DN topic in her own education	Bachelor in nursing
N7	Leadership in profession team, more first aid, terror Have not had DN topic in her own education	Bachelor in nursing and postgraduate education	**L7**	information in crisis, learn to keep calm, collaborate with other health profession, culture differences and reactions of trauma. Have not had DN topic in her own education	Bachelor in nursing

N8	Learn about flooding, hurricanes, avalanches, landslides, all types of disasters and what could happen. Have not had DN topic in her own education	Bachelor in nursing and postgraduate education	**L8**	Learn to managing and act, learning about nature disasters, risk of infection, mental health problems of going through a crisis. How nurses prepared themselves mentally, how to take care of themselves and at the same time care for who lay "in bed". Have not had DN topic in her own education	Bachelor in nursing and postgraduate education
NG1		1= BSc 5= BSc + postgraduate education 1= course 1= existing postgraduate education	**LG2**		2= BSc 4= BSc + postgraduate education 2= postgraduate education

First and second column present nurses view of disaster topic in a nursing education. The third column presents nurses education level where nurses want disaster topic.
In the fourth and fifth column are the leader's views of disaster topics in nursing education. The sixth column is the health care leaders` views where in the nursing education level the topic should be.

5.4.2 Rural Municipal Disaster Management Plans

As part of preparedness, Norwegian municipalities are legally required to possess an updated overall disaster management plan as well as an updated health preparedness plan (see Chapter 2, Section 2.5). Therefore, it seems logical that nurses and leaders should have knowledge of these plans in preparation for carrying out their work in a disaster situation. On the question of participants` knowledge of the overall municipality disaster management plan, this study found that there were varying perceptions between the cohorts of nurses and health care leaders. It is interesting to note that all eight health care leaders knew about the overall disaster management plans (100%); yet, only three of the eight nurses had this knowledge (less than 50%). Since nurses are the largest health working group in the rural municipal health system and therefore, in the front line, the plan should be well known among the nurses so that they should know their role in a disaster.

Surprisingly, only three of the eight nurses had knowledge of the overall disaster management plan (as shown in Table 5.4 describing nurses' knowledge of and involvement in the municipal disaster management plan and the health preparedness plan). Furthermore, only two of the eight nurses (25%) knew about the content of the overall municipal disaster management plan and these two nurses have both at an earlier

stage of their carrier worked as leaders. This means that they had seen the plans rather than been actively engaged in learning or finding the plans. Remarkably, a nurse who is working in the home care unit was involved in a project focusing on the units' preparedness. She discovered when she and her leader carried out a more detailed investigation of the overall municipal disaster management plan that the plan had not been updated. *"We should have an updated municipal disaster management plan, but I have to say that the plan is not updated."* (N6).

Plans are required to be regularly updated (as detailed in Chapter 2, section 2.5). Another nurse who was also working on the project was aware of an overall disaster management plan, but not of the content and wanted to know more about the plan. On the other hand, a nurse who is working at a cottage hospital did know of the municipal disaster management plan and its content. Her knowledge of the content of the plan stemmed from earlier work as an emergency nurse for several years, and therefore this nurse has a considerably experience with nursing in crisis situations as a first responder.

However, some of the nurses who did not know about the municipal disaster management plan understood that there should be some kind of crisis plan, but they did not see this as an overall disaster management plan. It is interesting to note that nurses are aware that they will be used in emergency situations, but they did not know their role or their unit's role in the plan. This lack of knowledge about what part they play in a disaster is intriguing, especially since the municipal 'base plan' sets the policy for the health care emergency response. One nurse said:

"I know that the local government has crisis plans, but it is not us (the nurses) that manage it. As nurses we will be incorporated when we are called into this "crisis team", and then we have to come there…." (N4).

This nurse had twice been called to an emergency at an institution and felt that this was her function, but she did not know the overall disaster management plan at all.

In studying the nurse's involvement in the overall municipal disaster management plan only (Table 5.6), it is seen that the majority of the nurses responded negatively to this question. What is surprising is that only one nurse had been involved in developing the

municipal disaster management plan and her job was to analyse hazards in the community. Another nurse explained that she is now involved in reviewing the plan. Taken together the result of nurse's knowledge of the overall disaster management plan and their involvement in developing these, it is clear that nurse's roles and profession ought to be far more incorporated and directly involved in the municipal disaster preparedness work. Consequently, this gives a direct support to the 'DN-ND' framework as outlined in Chapter 3 an it also opens the discussion for both nurses' educational needs and those of the municipal leadership as discussed in Chapter 6 (see also Tables 6.3 and 6.4).

All of the eight (100%) health care leaders (LG2) knew about the overall municipal disaster management plan. This result was expected, because the leaders need to manage their department or unit with respect to laws, regulations and plans. An interesting finding from the data was the manner in which the overall disaster management plan became known to the units. The health care leader leading a rehabilitation unit discovered how the unit was placed in the municipal disaster management plan when an aircraft crashed. At that time, she was working as an ordinary nurse, she said:

"..it was about six month after the unit had been opened when we got a message about an aircraft accident…. .and someone from the emergency department at the hospital called us and asked us to be ready to empty the ward of patients as soon as possible, so that we would be able to receive patients from the hospital" (L6).

The nurse that got the message was not aware of this plan. Intriguingly at that point no one at the unit, especially those who were on duty, knew about the plan and the expectation of involvement in a crisis or disaster situations. Furthermore, the health care leader was also critical of the hospital staff, because they should have contacted the municipal disaster management team leader first. Nevertheless, this leader thought that the event had been a provocative lesson to learn and that it also had an effect on how the local government followed this up and reviewed the plan.

If we take into consideration that half of the leaders (LG2) were relatively new in their position, it might have an effect on how they answered the question of how the nurses' profession had been used when the municipal disaster management plan was developed or in the reviewing of the plan. The result of this study shows that only two (25%) of the

health care leaders knew that nurses had been involved in developing the municipal disaster management plan. A health care leader said that when the municipal disaster management plan was developed the unit did have a psychological nurse as a leader who was involved. Surprisingly, as many as six of the health care leaders (75%) did **not** know if nurses had been involved. The idea of nurse's lack of involvement was also uncovered when the researcher studied the prevalence of Norwegian local government disaster management plans (Holdo et al. 2017).
One of the health care leaders said:

"I don't think it is tradition to involve nurses from different units. Those plans are developed mainly by administrators…. Which I believe is a weakness" (L3).

Taken together this result and the result of the earlier review of nurse's involvement in Norwegian local government disaster management plans strengthen the impression of the lack of nurse's involvement. Ideally, a nurse's role and position in disasters should be known both by the municipal management team and by nurses themselves. The fact that this is not the case and that nurses need this knowledge further underlines and strengthens the support for the attributes given by the ND and DN routes as outlined by Chapter 3. This is further discussed in Chapter 6 together with proposals for improving the present situation. Nurses should be and need to be represented in discussions concerning their community and in the municipal health preparedness plan. Furthermore, their input should be heard and be integrated by emergency planners and health care leaders to ensure that the municipality is prepared. This brings us to nurses' knowledge of the health preparedness plan, a plan that can have a direct impact on their work in emergency situations.

5.4.3 Rural Municipal Health Preparedness Plan

The health preparedness plan will have a direct effect on the unit or units where the nurses' work if a disaster or a crisis situation should occur. This preparedness plan should be known by all of the personnel working in the municipal health care services. Primarily, only half of the nurses reported that they actually knew the municipal health preparedness plan as shown in Table 5.4. Whilst this is not a legal requirement, it is an expectation that health care staff should know the plan (Chapter 2, section 2.5). These are deficiencies that need to be addressed in Norway and perhaps especially in the rural, vulnerable north, in

addition to the proposed changes in education and are also discussed in Chapter 6. If we compare nurses' knowledge of the municipal disaster management plan, where only two nurses knew the content of the plan then the present result relating to the health preparedness plan is better. However, it is somewhat surprising that only one nurse had been familiar with the manner that her unit would be involved in a health care disaster. Interestingly, she knew how the local hospital would use the nursing home because she had earlier been working at the local hospital and therefore, knew about the plan to move patients from hospital to the nursing home in a disaster event.

" I know from the hospital preparedness plan that patients who are at the hospital and are able to be moved - will be moved to give the place and resources to patients who need special medical care" (N1).

What is surprising is this lack of information of health preparedness plans among the nurses (NG1). Nevertheless, nurses also have an obligation to keep themselves updated about laws and regulation that could affect their work. On the other hand, the health care leaders should ensure that nurses' have the appropriate knowledge so they are able to carry out their work especially in disaster situations. This lack of knowledge was underlined by one nurse who did not think that nurses at the nursing home would be directly involved if a disaster happened. This lack of knowledge about the health preparedness plan was also commented on by a nurse working in the home care unit.

"We have a plan here, 'inside', but I don't know about plans for what we are supposed to perform outside" (N5).

However, four of the nurses (50% of NG1) did have some knowledge of the health preparedness plan, again as shown in Table 5.4. The responses from the nursing cohort (NG1) varied from having good knowledge of the content of the plan to just knowing about the existence of the plan. Effective health preparedness depends on health care workers knowing what is expected of them in an emergency or a disaster situation. If a disaster struck, the health preparedness plan would give nursing staff guidelines on how to act suggested a nurse with knowledge of the contents of the plan. *"We have plans for given situations and you need to follow the plan if something should happen"* (N7).

Another nurse at a home care unit talked about an experience that shows the importance of having a plan for emergency situations. This occurrence took place on a Friday

afternoon when the road into a village was closed by an avalanche and there were no plans suggesting how the home care nurses should reach patients who lived on the other side of the avalanche. There were no other plans for giving patients in the village help from home care nurses. She continued:

".....Recently we were put to the test when a road into a village was closed by an avalanche. It always happens on a Friday…. We did not have any plans in writing to relate to, so my thought was, what do we do? (N6)

In this case, the home care nurses managed to get help to the patients in the village during that weekend. However, when the weather is bad in rural areas there are several other villages which also could be exposed to an avalanche (or earth/stone slide). In order to secure that health care is available to people living there it is necessary to take some action to be on the safe side. The nurse continued:

"Then, we saw challenges in as much as a stone slide could also happen to take place in another village and this could be worse because of the distances involved.....But, we solved the present problem in a very good way with preparedness during the whole weekend. We got a nurse to stay in the village on duty that weekend…. Then we also secured the staff, so they did not have to drive through the dangers of an avalanche and the patients got their help that they needed" (N6).

In this example, everything turned out well, nevertheless it also demonstrated how important it is to have a plan for emergency situations, a health preparedness plan, especially in rural communities with long distances between the city and villages. Furthermore, a plan to use in emergency situations, will employ the nurse resources more efficiently and in the end that will benefit the inhabitants need for nursing. The example also demonstrates that the nurses can make a valued contribution and that Disaster Management training as suggested in Chapter 3, Section 3.2 will better capture their contribution. This further supports the 'DN-ND' Conceptual Framework given in Chapter 3. The example reveals that there is a knowledge gap but it also shows that nurses perceive and demonstrate that they can make a valuable contribution. It goes on to follow that it would be good to capture and enhance contribution in a systemic way – hence the need for better Disaster Management education for nurses in general as advocated by Chapter 6, Section 6.3.

Mindful of this, the nurses in NG1 were questioned on how involved had nurses been in developing and reviewing the municipal health preparedness plan? Revealing this could give us an idea of how the plan is implemented in the nurses' work and provide indications in relations to the degree to which nurses were providing consultation and even leadership in terms of disaster health preparedness.

Since the municipal health preparedness plan has a direct impact on nurses' work in a disaster or emergency situation, their contribution to the development and review should be mandatory and obvious. It should be a critical part of any future DN route for certain and should appear preferably in both DN and ND provisions. Municipal nurses, especially those who work in the home care system in a rural area are likely to be at the frontline of a disaster and will have significant insight into the immediate needs of the community. Therefore, their competence should be valued in all phases of disaster and emergency preparedness as further deliberated in Chapter 6, Section 6.3.

The data from the interviews displayed in Table 5.4 (NG1 - nurses' involvement) show that four of the nurses (50%) said that they had been involved in some way or have knowledge of nurses who have been involved developing health preparedness plans. The remainder of the nurses had not been involved in the work with either developing or reviewing the plan. A number of the nurses said that they knew that there was a health preparedness plan, but they were not aware of the content or who had been involved. Table 5.4 also illustrates that there is a correlation between the nurse's lack of knowledge of the plan and knowledge of nurse's involvement in the plan.

Studying the replies of nurses who have been involved and which demonstrates in what manner they were involved, the data from the interviews shows a variation between the nurses on the extent of their involvement. Nurses' perception of involvement is exemplified by a nurse who works in a home care department, she put it like this:

"…. I know that the leaders have worked on a plan for bad weather…and there we were involved. We came up with suggestions of things that we needed to remember and so on. In that case everyone was involved" (N2).

Interestingly, a nurse who recently had been involved expressed clearly that the involvement depended on the actions of the leader, she had been involved in the unit part

of preparedness in the municipal health plan. At her unit they have a new leader who took the health preparedness plan seriously and put together a team who worked through the home care preparedness part in the municipal health preparedness plan. Overall, these results indicate that nurses' involvement in developing and reviewing the health preparedness plan is low, especially given that nurses are the largest health care working group in the community.

All the health care leaders (LG2) knew about the municipal health care plan as revealed by Table 5.5. However, two of the eight health care leaders (25%) have not been involved or knew about any nursing involvement at all. Interestingly, the result also shows that only one of the health care leaders had been involved from the start when the plan was developed. This lack of nurses' leaders' involvement in the first phase of developing the municipal health preparedness plan could have something to do with how long they have been leading the unit or department. However, since the health preparedness plan always should be updated and reviewed once a year, this feedback is somewhat disconcerting (Chapter 2, section 2.5). Therefore, health care leaders especially those who are leading nurses should be involved reviewing the plan.

Intriguingly, one of the leaders who is leading a nursing home unit said that her involvement in reviewing the health preparedness plan was just a coincidence, she said:
".....the local medical officer should be reviewing the plan, but because of lack of staff the doctor was taken off the project, and ....I got involved" (L5).

This lack of nurse's professional recognition by the local Government is unsatisfactory because the municipal preparedness would be stronger if all health care professions were included in the planning work from the start.

Furthermore, health care leader's expertise is useful in highlighting possible health care hazards in disasters situations; thereby generating a strategy to assure nursing help to the inhabitants and ensuring correct and efficient patient flow throughout the municipal healthcare system. As one leader who had been involved reviewing health care plans saw the advantage of having health care knowledge and continuities in the reviewing work:

"I have reviewed the plan for the psychosocial crisis team, and I am now reviewing the municipal health preparedness plan where we compare this against potential health care hazards" (L1).

This leader was head of a local municipal health care system and is therefore responsible for the municipal health care department having an up-to date preparedness plan. Reviewing the plan and taking the nurses opinion was suggested by another health care leader. Surprisingly, there was variation amongst the leaders' opinions on how well the nurses knew the plan. Nevertheless, the health care leaders did have this in mind and some expressed their concern and one of the head of a municipal health department said: *" ..We are very concerned about that they (plans) are understood, and that they (plans) are accepted and integrated into the daily work"* (L1).

Another leader who is also head of a municipal health care department was uncertain if nurses who perform the daily nursing duties are familiar with the plan. She thought that especially nurses who are part of the psychological crisis team should have a more in-depth knowledge of the plans. Furthermore, she was aware of the health care leaders' responsibility and that this is important and should be taken into consideration. It is important to have in mind that the participants from health care leaders worked at different levels in the municipal health care system. Therefore, leaders who work closer to the nurses have more information of the nurses' knowledge about the health preparedness plans. This was underlined by a health care leader at a nursing home unit, where she knew the nurses working there and their competence. This is one of the advantages of working in a small rural community. As we can see from the above there was uncertainty amongst leaders if nurses were familiar with the health preparedness plans in the municipality. They should ensure that nurses know the plans that will regulate their response in such events to strengthen the municipal preparedness.

Table 5.4 Nurses' knowledge and involvement in municipal disaster management plan (MDMP) and health preparedness plan (MHPP)

Nurse	Knowledge of MDMP	Involvement in developing or reviewing MDMP	Knowledge of MHPP	Involvement in developing or reviewing MHPP
N1	Yes, but not the content	No	No	No
N2	no	No	I think we have	Been involved plan for bad weather besides that no knowledge
N3	no	No	Working on a preparedness plan for the department	Knowledge of nurses involvement in the work of the department part of MHPP
N4	no	No	Yes, but not the content	No
N5	no	No	No	No
N6	Yes	no, but involved now	Yes	Involving reviewing the departments part of MHPP
N7	yes	Yes, been involved analysing hazards	Yes	Yes
N8	no	No	No	No
NG1	Yes = 3 (37,5%) No = 5 (62,5%)	Yes = 2 (25%) No = 6 (75%)	Yes = 4 (50%) No = 3 (37,5%) Unsure = 1 (12,5%)	Yes = 3 (37,5%) No = 5 (62,5%)

The second column presents the nurses knowledge of the MDMP and the third involvement developing or reviewing the plan. The fourth column presents the nurses knowledge of the MHPP and the fifth column involvement in developing or reviewing the plan.

Table 5.5 Covering leaders' knowledge and involvement in municipal disaster management plan (MDMP) and health preparedness plan (MHPP)

Leader	Knowledge of MDMP	Involvement in developing or reviewing MDMP	Knowledge of MHPP	Involvement in developing or reviewing MHPP
L1	yes	No, the plan was developed when I started working there	Yes	Yes
L2	yes	No, the plan was developed before I started working there	Yes	Will be involved in reviewing the plan
L3	yes	no	Yes	No
L4	yes	no	Yes	Involved reviewing the departments part of the MHPP
L5	yes	no	Yes	Been involved in reviewing the MHPP
L6	yes	yes	Yes	Knew about nurses' involvement
L7	yes	yes	Yes	Yes, knew about nurses involvement
L8	yes	no	Yes	No
LG2	Yes = 100%	Yes = 2 (25%) No = 6 (75%)	Yes = 100%	Yes = 1 Yes now = 3 (37,5%) Knew about involvement = 2 (25%) No = 2 (25%)

The second column present the health care leaders knowledge of the MDMP and the third involvement developing or reviewing the plan. Fourth column present the health care leaders knowledge of the MHPP and the fifth column involvement in developing or reviewing the plan.

5.4.4 Rural Municipal Health Care Preparedness

There may be little or no time to make any additional preparations when a disaster or a larger emergency strikes a community. In order to protect life as well as securing necessary healthcare services, all units in the municipality need to have the appropriate resources ready and available to do their part together with well trained staff. Municipal preparedness plans are regulated by law and the local Government has an obligation to ensure that people working in the health care system have the necessary training to be prepared for a disaster (Chapter 2, Section 2.5).

Nurses working in the municipal healthcare system are used to provide aid and care during a variety of challenges and they often need to improvise, especially the nurses who work in rural home care units. The expertise nurses have is needed and necessary in health care emergency situations as well as in disasters, they play an integral role in the

municipal response and preparedness. Therefore, the participants were asked about disaster training experiences, astonishingly the majority commented that they have little or no training at all. However, some have been sporadically involved in training, but most of the training was fire training. Unfortunately, such a situation appears to not be uncommon in Norway as pointed out by Chapter 6, Section 6.4 based on official reports from a recent near disaster event. A possible reason could be given in Section 6.4 which is based on a report by Magnussen et al (2018) from a large exercise in northern Norway where all emergency departments constituting "Search and Rescue" were involved, but not the medical department involving nurses.

Remarkably, there was only one of the eight nurses who had been involved in regular emergency training as well as disaster exercises. This nurse was working in a rural municipal cottage hospital located a long distance from the nearest hospital, she said:

"We have training and we have exercise once a month with doctors, ambulance, SeaKing (helicopter)… We train for emergency scenarios such as fire and gas leak and of course training to collaborate between the professions groups" (N7).

The remainder of nurse's responses show that there is a lack of emergency training and disaster exercises in the municipal health care services. The majority of the nurses who reported that they have been to emergency training were nursing home nurses and this was mainly fire training inside the institution. Nonetheless, there was a difference between the nurses how advanced this training had been, some had only gone through the procedure and some had trained on evacuation of the patients. One nurse said that she had been to an emergency training but this was several years ago. She expressed her fear of a fire at the nursing home, especially in the night and she had a specific situation in mind. A fire in a fuse box was stopped by a nurse on a night shift and this event has had an impact on the participant. She was afraid that a fire in the night would be a disaster for the elderly patients living at the nursing home because there are fewer staff at night. Furthermore, the nurse felt that the lack of trained personnel could put the nursing home preparedness at risk.

"…several people on the nightshift are unskilled (without any professional training) carers who may not have experienced fire training. The vast majority should have been through fire training, but it is seldom that this training is scheduled…." (N1).

Overall, the result of these data suggests that nurses who are working in key positions and who will be called upon to help in health care disasters have no or at best inadequate training. Notably, the result from the data of the health care leader's response did vary from no experience with health care disaster training at all to participating in a table-top exercise. However, nurses in leadership positions are responsible, in a disaster response, to coordinate personnel and other resources as well as to have regular training to be prepared. Only four of the health care leaders (50% of LG2 cohort) were familiar with crisis training in some form. Two of the four health care leaders talked about fire training inside institutions, one leader from a nursing home and one leader from a rehabilitation unit. Firstly, the health care leader of the rehabilitation unit talked about how their unit started to take the fire training seriously. An unexpected inspection from the fire department to the unit, took place and at this point in time the summer "temps" had just started in their job, and they did not know the fire procedures. The unit was given an order from the fire department to have all personnel trained. Furthermore, she said that they took this seriously and the next year they organised two training sessions one notified and one not notified fire training. They trained on evacuation of patients and checking out that all the emergency exits could be used in the evacuation. The achievement was expressed by the health care leader: "*We have obtained very good feedback and the unit is now run as stipulated by law."* (L6).

This shows the potential use of the 'DN-ND' framework as outlined in Chapter 3, Section 3.2. Securing the personnel who know how to act in an emergency situation will also have a positive effect on nurses' ability to be prepared and be professional in a disaster situation.

However, another health care leader explained that an environmental problem influenced the fire training at the nursing home. There the fire department used to have training events with the personnel at the nursing home once a year. However, a new environmental law put an end to the fire training because the special substance they use to put out the fire was damaging the soil in the ground where the exercise took place. Therefore, they were only allowed to have this type of training at special locations where toxic waste was allowed. Longer distance to these locations had an impact on the training because it is more difficult to organise and it demands more resources thus reducing the amount of

available training. This puts the health care leader in a position where it all comes down to how the use of resources will have most effect on the nursing home preparedness.

Furthermore, if this means lack of exercise for nurses working at the nursing home, it will have an effect on nurse's confidence in handling fire situations.

"We, nurses need to be involved in more exercises and stop being involved in the same safe routines. It is necessary with more practical as well as theoretical knowledge. There is no reason why we will be inside a warm house if a disaster takes place. In a natural disaster we might have to crawl in the mud. Maybe we should exercise or train with somebody drenched in cold mud and observe that blood vessels actually contract when they become cold. I think we need some real competence, not only training in a warm exercise room" (L8).

If we now look at experience from disaster exercises, Table 5.6. five of the eight health care leaders have some kind of experiences. Interestingly only two of these leaders have been involved in tabletop exercises and even these were different. One leader recounted a tabletop exercise including the whole municipal disaster management team and the county governor who was observer and gave them feedback afterward. Another leader who is leading a ward at a nursing home talked about her experience from the tabletop exercise:

"…. *someone from a municipal office called us up to find out how many patients we were able to send back home in order to free spaces"* (L8).

It is astounding that this was the only exercise event she had participated in since she became a leader of the ward, she said: *"... This was a sort of paper training….and nothing more"* (L8). Disappointingly, this shows that the health care leaders' own preparedness with emergency training and disaster exercise is also quite varied.

An important part of the rural municipal preparedness for disasters involves having a store of medicine and medical equipment especially since it could be far to the next supply storage and take a considerable time to get there. In emergency situations, such as in a natural disaster, where the road is blocked can have an impact on medical supplies. Two of the eight health care leaders talked about that even during normal circumstances it could take some time to get medical supplies and this could be much worse in a disaster or emergency. One leader articulated this in the following manner:

"I don't think we are well enough prepared, but I don't think Norway in general is sufficiently well prepared. Because, we see a considerable lack of medicine in peace times…we cannot get hold of ordinary medicine such as Ventolin and Atrovent (asthma medication) on a daily basis….We don't have any medical crisis stock…in our municipality…we don't have many resources to help us"(L8).

The head of the municipal health care department also put forward the problem of shortage of medical stock and she hoped to persuade politicians to see the necessity of having a medical stock for emergency situations. Since the municipality is in a rural area, she felt there was even more need for a medical stock so they could manage in a crisis or some period without being supplied.

This shows the importance of nurse leaders' involvement in decisions that could have an impact on the nurse's ability. Lack of medical supplies in normal times could be seen as a "disaster" in itself. However, both nurses and health care leaders did talk about the problem with lack of resources generally in the municipal health care system. Therefore, it was surprising that only two of the leaders specified the medical problem that could occur.

In terms of exercise and training, it is assumed that training experiences should involve personnel training inside the health care unit about how to manage emergency situations. This could be for example training of evacuation, fire response, first aid and emergency response.

A tabletop exercise is there to allow disaster management officials to practice their emergency response plan where a narrative hypothetical scenario is discussed and analysed, but also to identify problems and weaknesses in the plan.

Disaster exercise experiences (full-scale exercises) should involve a scenario-based event as close as possible to an actual disaster. All relevant municipals units and department will be involved and all other emergency services and relevant voluntary organisations

Table 5.6 Nurses and leaders' emergency training and mass casualty or disaster exercise.

Nurse	Training experiences	Exercise experiences	Leader	Training experiences	Exercise experiences
N1	Fire training	No	**L1**	Yes	Yes
N2	Fire training	no	**L2**	No	Yes, a table top exercise amongst the leaders in the municipality, but not out in the field
N3	no	no	**L3**	No	No
N4	no	no	**L4**	No recently	Yes, some years ago
N5	no	no (since the military)	**L5**	Yes, fire training	Not in this job
N6	Yes, several years ago	no	**L6**	Yes, a fire training	No
N7	yes	yes	**L7**	Yes	Yes
N8	Fire training	no	**L8**	No	Yes, a table top exercise
NG1	3/8 (37,5%) = no, 4/8 (50%) = irregular training, 1/8 (12%) = regular training	7/8 (87,5%) = no, 1/8 (12,5 %) = yes	**LG2**	4/8 (50%) = yes 4/8 (50%) = no	5/8 (62,5%) = yes 3/8 (37,5%) = no

Both leaders and nurses with the exception of one, agreed that no part should be removed from the present-day syllabus for BSc in Nursing. Five (62,5%) of the nurses saw the advantages of disaster topics to be present in both Bachelor nursing and a postgraduate degree, 12,5% of the nurses felt that disaster nursing topics should be a part of a bachelor in nursing. One nurse (12,5%) had a clear opinion that a postgraduate course was the best location for disaster topics as it could reach all nurses and one nurse (12,5%) suggested that disaster topics could be taken in to an existing postgraduate degree in emergency. Four of the eight health care leaders (50%), thought that disaster topics should be a part of both a Bachelor in nursing and a postgraduate degree and two of the leaders, 25%, in a postgraduate degree. Furthermore, two of the health care leaders (25%) thought disaster topics are needed to be part of a Bachelor in Nursing.

Knowledge of the municipal disaster management plan is presented in both Table 5.4 and 5.5. The knowledge of the plan was not surprisingly high amongst the health care leaders, 100%, whilst only 37.5% of the nurses knew about the plan. However, the participation in development of the plan was equally low at 25% for both leaders and nurses.

5.4.5 Summary

The result of the nurses (NG1) and health care leaders' (LG2) knowledge and involvement in the municipal health preparedness plan, presented in Table 5.4 and 5.5 shows that 50% of the nurses knew the plan and 37,5% did not know the plan at all whilst 12,5% were unsure. Further, 37,5% of the nurses had been involved or knew nurses who have been involved and 50% of the nurses did not know about nurses' involvement in the health preparedness plan. Turning to the health care leaders, 100%, did know about the health preparedness plan and 37,5% had been involved in reviewing the plan. Two of the leaders, 25% had not been involved themselves but knew about nursing involvement and one, 12,5% had been involved developing the plan. However, two of the health care leaders, 37,5 %, did not know if nurses had been involved in developing or reviewing the plan. Given the low levels of knowledge and awareness of the respective plans, it would seem that this aspect should be a focus of attention by rural Norwegian municipalities regardless of whether DN or ND routes and trajectories are considered (see DN-ND Framework – Chapter 3).

The results indicate there was no difference between nurses and health care leaders' experiences with training for crisis situations, as shown by Table 5.6. Furthermore, Table 5.6 demonstrates that the differences increase between the two groups when it comes to be involved in disaster exercises. Interestingly, the nurses' participation in disaster exercises was surprisingly low, only one of the eight nurses had this experience. Furthermore, as Table 5.6 shows, only four (50%) of the nurses had any kind of training at all for crisis situations and of those, three nurses had been involved in fire training. However, not all of the nurses had this training as a recent experience or practise. One nurse reported that it had been several years since she participated in any form of training or exercise. The health care leaders, however, did have more experiences with disaster exercise than the nurses, 62,5 % of leaders (LG2) had been involved compared with nurses (NG1) 12,5%, (see Table 5.6). This section also revealed that there was a lack of medical and medicine supplies that could also affect how the municipalities are prepared for disaster situations and this is further discussed in Chapter 6.

5.5 Rural Municipal Response

Rural municipal response is the third phase in the result "wheel" as displayed in Figure 5.1. A municipality's ability to respond in a disaster depends on how prepared they are. Leadership is important at all levels, and since nurses often are present in most of the levels, their contribution is vital for the municipal health care systems response to a disaster. Therefore, it is interesting to know how nurses and health care leaders think of nurses' ability to lead in disasters. Another theme that is important in the response phase is the use of media and technology in such a situation. Participants view on the municipal health care units' ability to respond in health care disasters gives an indication how rural municipal response will be in a disaster.

5.5.1 Nurses' Leadership in a Disaster

The approach that nurses take to leadership in a disaster may have a significant effect on nursing in a disaster situation. Management of the nursing staff in the given situation involve also how to give orders therefore communication is of great significance. Since some of the nurses are better trained and suited to certain types of tasks than others, the health care leaders must have knowledge of nurses' skills and give them work where they can do the best possible job. However, nursing is also leading in some form, therefore several of the nurses expressed a positive view of their ability to lead in a disaster. In fact, four of the eight nurses questioned the ability of nurses to lead and had a positive response, although they gave differing reasons as expressed by Table 5.7. One of the home care nurses was adamant that nurses who work in a home care unit are used to deal with emergencies because they are mostly working alone and have to manage their own work in the field. She said that they often had to use creativity to solve problems, especially when they are out in the rural area far from the office and any doctor. Another nurse had a similar view when she talked about nurses' fundamental skills from nursing education and work experiences that should make nurses able to lead at a disaster scene. However, she also thought that something happens inside the nurse that brings forward the knowledge they already have. On the other hand, she said that there are nurses who could feel unprepared and can therefore be paralysed, further she put this across as:

"But…. it depends on what kind of disaster it is and what you will meet there and how many are involved…. I think they (nurses) can lead" (N6).

Similar views were held by another home care nurse who said that in an emergency situation it is important not to let panic take control, instead act and think afterwards. An opposing view was given by a nurse also working in home care, her view was that no one working in home care would be able to lead in a disaster and that they therefore are in need of more leadership education and training. Furthermore, this nurse thought that they need to be trained and drilled in the same manner as the police, ambulance and the fire brigade who have training sessions and joint exercises several times in the year. More training and education to be able to lead in a disaster was a view that most of the nurses had, Table 5.7. Not surprisingly the nurse working in a cottage hospital thought that nurses at her place of work are able to lead in a disaster:

"… *we often train on the nurses leading role in emergency situations at several levels. It is the nurse who will have the overview and leading the job further"* (N7).

However, she also was of the opinion that people are different and therefore she thought that not all nurses are able to lead regardless of an incident being an emergency or a disaster. Interviewed health care leaders (LG2) on the other hand were more confident that nurses could lead in a disaster. In fact, five of eight leaders believed that the nurses were able to lead in a disaster although their reasons and caveats varied. In addition, one leader pointed out that nurses with experience were in general able to delegate and prioritise as well as having a holistic perspective especially those with experience. At the same time some of the health care leaders also think that leading in a disaster depends on the person. This brings us to a health care leader who is leading a home care unit and she thought that leading a disaster depended on the personality type and that has to be defined in advance:

".. I think there are many (nurses) who are able to do that. However, I also believe that many (nurse) are not able. They (nurses) have different personalities as the rest of us. I would have chosen…carefully who I would put into leading based on professional confidence and personal confidence" (L4).

Thus, a total of five leaders (of the LG2 cohort) were certain that nurses needed both more training and exercises in order to have such a responsibility to lead in a disaster: *"Yes, but I think none of us are born leaders in a disaster without training"* (L3).

As shown again in Table 5.7 even with similarity between nurses and leaders on the nurses' ability to lead in a disaster, not all the nurses, indeed, as many as half of the nurses, did not agree. The data also shows that health care leaders have different views concerned

with the nurses` ability to lead in a disaster situation. The majority of the leaders thought that the nurses were able to lead a disaster event and only half of the nurses (50%) agreed with the leaders. However, the reasons given varied both within the nurses' group (NG1) and the leaders' group (LG2). Furthermore, training was highlighted as a necessity in order to perform leadership in a disaster.

Table 5.7 Nurses' leadership in disasters

Nurse	Response	Leader	Response
N1	I hope I never will be in such a situation. However, I know how to meet for instance the fire brigade and give information. But I don't trust the competence of the employees which can be quite varied	**L1**	Yes, I can see that nurses are able to lead at an emergency scene, but it depends on the person. There are different types of nurses. Therefore, it is important to define which nurse in advance and give them courses.
N2	You can't let the panic take over, you just have to act and think afterwards	**L2**	Yes, I think nurses are good at having a holistic perspective. When they have training, they will have an overview. Nurses with experiences are good delegating and to prioritise.
N3	This is something I would like to learn more about. Because it is not something you do every day.	**L3**	Yes, but they need to have that kind of training.
N4	Yes, I think we who work in home care are able because we are used to work alone and solve problems on our own, be creative.	**L4**	Absolut, but I think also it depends on the nurse. They are all different persons.
N5	I don't think anyone in home care are able to lead today, but if there were courses and we learn about it and we have regular training then yes.	**L5**	Yes, the nurses who work at my place of work.
N6	Yes, I think nurses can lead, we have something basic with us from our education.	**L6**	-
N7	Yes, I think we are, but I also think there is difference between nurses, so it depends on the nurse.	**L7**	-
N8	Yes, I think they are	**L8**	No. Scene command, you need to train and have practice exercises regularly to be able. An ordinary nurse at the nursing home or at hospital is not able.
NG1	Yes = 5/8 No = 3/8	**LG2**	Yes = 5/8 No = 1/8 Not answered = 2/8

The table above shows nurses' response to a question about leadership in disasters on the left side of the table and the health care leaders' response on the right-hand side.

5.5.2 Use of Media and Technology in a Disaster

Use of technology in health care has expanded significantly in recent years and its present importance is demonstrated by Figure 2.4 (Chapter 2). Technology is used to help and support health care professionals such as nurses making their job easier and quicker and it can therefore be of appreciable help and support in both emergencies and disasters. Table 5.8 reveals the overall results from questioning associated with media and technology. Nevertheless, there were differing views among the participants about the usefulness of technology in a real disaster event and importantly how it should be used. Media and especially social media are other tools for nurses to use in a disaster response phase and it is therefore of considerable interest to learn how the participants view its use. This could provide important insights into the practical role of media and technology perceived to be required as part of the DN and ND provisions (as discussed in Chapter 3 and the DN-ND Conceptual Framework.

Media will be reporting the situation to the public and could therefore be of help for the municipal health care system to reach out to the inhabitants with information. However, the journalists' "eagerness" to report from the scene could affect the first responders such as, nurses working in a disaster event. While the majority of the nurses (NG1 cohort) thought they would have nothing to do with the media because information to the media was the responsibility of their leader or the municipal communication department's responsibility. On a practical level then, the results suggest that crisis communication with media is perceived as not part of general nursing education nor as part of the enhancement of general nursing skills to do with disasters (ND route – see Chapter 3). One nurse focused on the idea of dealing with the media further and thought that it could be the nurses' job to keep the journalist away from a disaster scene, she articulated her opinion as:

"…I think that it also will be our job at a disaster scene to keep those people (journalists) away and ensuring that patients or the people we take care of must be shielded as much as possible" (N3).

The interviewed health care leaders (LG2 cohort), however, talked about that there was a strategy in the municipal management team of informing the media in a response phase of a disaster. Nonetheless, there were leaders who feared how the press will use the information. A health care leader was afraid that media could create panic instead of calming the inhabitants; she shared the opinion that journalists are not health

professionals and therefore can misunderstand. The journalists' lack of health care competence could affect their ability to assess the situation even if they are at the scene according to this leader. Therefore, she thought it was best that the inhabitants should use more trusted sources for information such as from the police, where the updating is more reliable. Another leader was more positive to use the media to spread information in crisis times such as disaster. This health care leader thought that media have an important job to bring out information to the public, she expressed her view as:

"Media have a large and important task when it comes to disasters. Therefore I think that the municipality must at least have focus on providing fast and correct information out…" (L6).

Furthermore, this leader also thought that some of the nurses should be constantly updated of the situation and give the correct information out to people. This was associated with a leadership function, more compatible with the DN route of the DN-ND Conceptual Framework.

Social media has had a rapid growth in recent years and is now widely used by many and for a wide variety of purposes. A cautious concern related to the power of the social media providers can be seen by the closing down of even the US presidents' accounts. In terms of personal and medical data, the openness of social media means that there have to be restrictions in its use for example in a disaster. Whilst nurses, have confidentiality guidelines on spreading information, this is not the case for private persons who do not have this type of responsibility. Unfortunately, there have been many examples of pictures from accidents being placed on various forms of readily accessible social media and this was something that enraged the participants. One of the nurses had strong feelings about this and suggested that this should not be allowed. Another nurse did not think that social media was an information source that should be present at a disaster scene, she commented:

"*People should not take photos… I don't think they belong there, and the reason relates both to ethical and professional confidentiality…. relatives should not get the sad news through unnecessary pictures in the media…."* (N4).

Furthermore, two of the nurses (25% of NG1 cohort) expressed that, beside the confidentiality, social media could be an additional burden for health care staff in an

emergency or a disaster situation. Nurses shared the opinion that this is a challenge that will also be there in the future. A contrary view was held by a nurse (N8) who suggested that social media could also have a positive potential and that it can be used as additional communication channels such as to call in nurses to work in an emergency: *"... everyone will be called in. So, I think that everything has to be used from the phone to Facebook"* (N8).

There was a common view among the health care leaders (LG2 cohort) that the internet was a good information platform and some leaders suggested that both social media and standard municipal web pages could be employed to inform the population as well as emergency and health staff. Nevertheless, the majority of the health care leaders (LG2 cohort) were of the opinion that social media should be used with caution. There was also a concern among the health care leaders that there could be an electricity failure in a disaster situation which could put down the internet connection and thereby destroy the communication channel out to the inhabitants. However, one leader - who is in charge of a municipal health department - thought that nurses should not be using social media at all in a working situation. She argued that use of social media in any health care situation represented an ethical dilemma and nurses should always think of the purpose of using it. If it is to document an injury with a picture from the event there are guidelines to follow, she put forward her opinion:

"But as a principle, my view is that no staff shall use social media or media…In our municipality we have a communication person who will do the communication with all media" (L2).

A health care leader of a home care unit was also sceptical to the use of social media in general, but hoped that people would use it in a sensible manner. Furthermore, she was clear that people at a disaster scene, will put unauthorised pictures and comments on social media that could be misinterpreted and may create anxiety and chaos which will complicate nurses' work:

"Social media is difficult because there are many out there who want to communicate ….. such as Facebook where people put out "stuff" without thinking it through and maybe relatives don't know yet…." (L4).

To be able to use social media there is a need for technology devices such as telephones and computers. Social media was viewed in a positive manner as a communication channel by several of the health care leaders, at the same time a similar number saw it as a danger. Opening-up the possibility to use social media could affect the privacy in the most vulnerable of situations that could be made public and be hurtful and cause dismay to those involved. There were different views among the nurses on how to use social media in a disaster.

Clearly, some technology is complex and requires training and education, but the concept of user friendliness means that some of the advanced technology may be more intuitively used. Nevertheless, one of the nurses highlighted the negative side where the use of health technology makes the nurses' work more efficient, but at the same time the technology distances the nurses from the patients. She feared that the human side of caring could lose the nurses focus and might be overtaken by technology. Clearly the human side of caring is something of great importance in a disaster as well. However, technology could also save lives as one nurse highlighted that solving the compatibility problem between some of the technological solutions in the health care system could save lives. This nurse thought it could make her work in rural home care a lot easier if there could be a solution on the compatibility differences between the computer programs at the health institutions:

"In some cases, it could ease our job in a disaster for instance if we could use technology to send the result of an ECG to the doctor and obtain a professional answer in a short time" (N3).

Interestingly, two of the nurses were worried about the increase in reliance on technology by nurses because much of the life supporting technology relied on continued electrical power. Lack of electrical power was something nurses in home care were worried about, especially when they were out in the field and a long way from the office. A home care nurse said that they have digital patients lists and she saw the scenario if the network broke down and without the information about the patients' they could have a problem. A similar problem was raised by another home care nurse, who expressed it in this manner:

"Everything is on the net (internet), the information about the patients, the medical information, everything about the patients are there and what do we do then? I have thought a lot about this because we have had some problems with the stability of the mobile network. We are very vulnerable" (N6).

Vulnerability was a concern another nurse pointed out when she expressed that they have been more and more dependent on the technology such as mobile units with all the information of the patients. She saw how helpless the home care unit was when the mobile network was down and they could not get hold of patients' information. Lack of access through mobile network will give nurses working in home care challenges and even more so in an emergency or disaster situation. She deemed it is important that nurses are more informed relating to strategies dealing with technological breakdowns and failures of critical infrastructure which are often accentuated at times of disaster.

The health care leaders' response (LG2 cohort), however, pointed out both a positive and negative side of using technology. Head of a municipal health department (L1) talked about the advantages of having access to documents by using iPads or mobile smart phones in an incident such as emergency or a disaster. She especially thought of the rapid reporting that could take place from a disaster scene to the people who are managing the disaster response. In the municipality where she was leader, they have started using a computer program where all 'real time' information of an emergency situation was reported and all information of people is anonymised to give to first responders, disaster management and people with special access to important information.

At the same time, this leader also talked about the advantages of technology such as iPads where home care nurses were able to update journals continuously. Whilst another health care leader pointed out that technology such as mobile phones should only be used to send short messages ensuring that nurses are prepared for what will meet them at an emergency scene when they arrive. Therefore, technology could be very helpful for municipal personnel in responding to a disaster situation. An example of such technology suggestions is given by a health care leader who saw the use of drones delivering medicine: *"….used for communication and also drones to deliver medical supplies to places cut off by for example avalanches"* (L3).

Another leader who is in charge of a home care unit had a more sceptical view on the use of technology, but she specified that this depended on the kind or type of technology. This leader revealed that she has had experience of computer programs that failed or

crashed, she feared for the outcome if there was a technology error, which could give devastating results:

"*… in the north (of Norway) the mobile network and the emergency network have been knocked out several times. How do we manage then (without internet access)? We must be prepared for such situation…..When technology works it is good, but does it work in a disaster? Transmission masts and networks can be subject to bad weather and avalanches……. how do we deal with this, during a disaster?"* (L4).

A similar view was held by a health care leader, who is leading a nursing home unit. She was concerned that the most relevant medical information of patients was stored electronically without hardcopy backup. She felt that in a situation where something goes wrong, the nurses will not have access to patient's information and consequently not be able to respond in a disaster situation.

The dangers of loss of critical infrastructure, such as, losing electricity and the internet in a disaster situation was a worry as cited by the majority of the health care leaders. Generally, the results suggest some variation; yet concerns around media and technology are more closely aligned with leadership among both cohorts of interviewees and would most likely be addressed through a specialist DN route of training (see Chapter 6, Section 6.4).

Table 5.8 Nurses and health care leaders view of using media (M), social media (SM) and technology in response to a disaster situation.

Nurse	Use of M/ SM	Use of technology	Leader	Use of M/ SM	Use of technology
N1	M= Information by a municipal spokesman	-	L1	Information to M and SM is taken care of by municipal spokesman	Yes
N2	-	Yes, if it works. use technology carefully without forgetting the human side	L2	Information to M and SM is taken care of by the Mayor or a spokesman	Yes
N3	M= Information out through a municipal spokesman SM= against use	Yes	L3	Information to M and SM is taken care of by a spokesman	Yes
N4	SM= No use of social media	We are too dependent on technology and will be helpless in a power cut or if internet go down.	L4	Information going through a municipal spokesman SM= no	Yes, if it works.
N5	SM= only to inform the inhabitants	Fine as long as internet works and we have electricity	L5	M= not the health professions task SM= Not from the scene	Yes, if it works.
N6	M and SM= It is our leader who give information out.	We are vulnerable if mobile net is down. We are too dependent of that the technological system is working.	L6	M = important bringing out information. Inside the unit nurses will be able to answered the phone. SM=uses careful	Yes, some could be useful
N7	M and SM= a municipal spokesman	-	L7	M= trough a municipal spokesman	Yes
N8	SM= if it works, yes to call in personnel.	Use the phone to call in health personnel	L8	-	Yes, if it works. Nurses need to be able to use "old" procedure in case of power cut or internet problems.
NG1	M= 4/8 (50%) Yes SM = 4/8 (50%) No SM= 2/8 (25%) No response = 1/8 (12,5%)	Yes = 6/8 (75%) No response = 2/8 (25%)	**LG2**	M= 7/8 (87,5%) SM = 4/8 (50%) No SM = 2/8 No response = 1/8 (12,5)	Yes = 8/8 (100%)

Column two and five present the participants view of using media such as newspaper and social media such as Facebook in a disaster. Column three and six shows the participant view of using technology in a disaster.

5.5.3 Summary

The nurses' (NG1) and leaders' (LG2) response to the nurses leading a disaster event and use of media and technology present some interesting findings. In general, there were more similarities between the two groups' views' around perceptions of the nurses' ability to lead in a disaster event. Five (62,5%) of the nurses and six (75%) of the health care leaders thought nurses were able to lead in a disaster. However, some of the nurses and the health care leaders were clear that this depended on the nurse´s personality if they were able to lead in a disaster event. Three (37,5%) of the nurses felt that they were not ready to do such a job in a disaster and this would affect the rural municipal health care response. Health care leaders however have a more optimistic view of nurses' ability to lead in a disaster event.

On the other hand, using media to inform the inhabitants in a disaster was a common view among both nurses and leaders. Four (50%) of the nurses did have a positive view about informing the inhabitants through media while three nurses (37,5%) thought that this information should go through a municipal spokesman. One (12,5%) of the eight nurses thought the information should be presented by her leader. Amongst health care leaders, seven were positive to use media as an information channel and five leaders said that all communication to the inhabitants should be handled by a municipal spokesman. However, one (12,5%) of health care leaders thought that nurses could be in charge to answer phone calls from relatives and tell them about the situation inside the institution. Some (25%) nurses were against using social media for working purposes, other (50%) nurses thought social media could be used to inform the inhabitants and to call in personnel. Two (25%) of the health care leaders did not think that social media should be used in a disaster. However, four (50%) of the health care leaders thought that social media could be used in a disaster situation and three (37,5%) of the leaders thought that this had to be managed by the municipal spokesman. One (12,5%) health care leader thought social media could be used but carefully. All the health care leaders thought that technology should be used in disaster situations. However, three (37,5%) of the health care leaders added: "as long as the technology works".

5.6 Rural Municipal Recovery

The recovery from an emergency or a disaster of a rural municipality depends on how severe the effect of this has been on the municipality and how this has been taken care of. Nursing in the aftermath of a disaster will often bring new and different challenges and the result depends on how they are able to respond to this. Findings from the data show that both nurses (NG1) and leaders (LG2) raised concerns about the psychological effects disasters have had on the inhabitants and the personnel after a disaster. One important factor the participants had in mind was the mental health of the survivors who experienced difficult times during the disaster. Mental health of survivors including staff needs to be monitored and this was pointed out by three of the nurses (NG1). It may not only be the survivors who need support, but also nurses and other colleagues could also have a need for support, counselling and debriefing in the recovering phase of a disaster. In fact, three nurses pointed out that counselling and debriefing of staff and survivors was important:

"… the nurse's role would be there to talk about their own experience and listen to others who have been going through the same experience, colleague support and comforting each other" (N1).

She also felt that the number of personnel must be increased to meet the patients need for mental caring in times after a disaster. Another nurse who shared this view also talked about those who not directly have been affected but will also have a need for some support. Therefore, she thought it is important that nurses are observant when they are working to ensure: *"…that everyone have an offer of assistance, debriefing or other help they may need"* (N6). A nurse working at a nursing home had patients in her mind when she thought it was important that the nurses' focus on having patients feel safe and secure, together with care for the relatives. She expressed that it is important that nurses should talk to patients who are not able to communicate what they have been through and at the same time be aware of the relatives need for information about their loved ones. Taking care of relatives was also something that a home care nurse thought would need support in the aftermath and home care nurses needed to focus more on during their daily work after a disaster. The nurse who worked at the cottage village hospital thought nurses should think ahead and not only care for the patient, but also care for relatives and ensure that they will be followed up.

Two other nurses (25% of the NG1 cohort) felt that it was important to call in the psychological crisis team in the aftermath of a disaster. One of the nurses who works in the municipal home care thought it was important to get the psychological crisis team to help inhabitants with their mental trauma after a disaster. However, another nurse put forward the mental health need of staff after a disaster and suggested:

"I think there should be a forum…where we could seek togetherness having psychological help if needed and follow up in the aftermath….by the psychological crisis team and the psychiatric services since we already have a close collaboration with the teams it could be a good solution" (N4).

Another nurse talked about that they should have a plan for taking care of those who have been involved and follow up with a debriefing. Going through what has happened and making sure that everyone has the opportunity to tell their story. On the other hand, others thought that in the aftermath there was time for considering their performance and reflect on their experiences. Evaluations of how they have handled the disaster situation was considered to be important*:*

"How did this work out? Were we sufficiently well prepared? Did we manage the tasks? What can we improve?" (N3).

Intriguingly, the focus nurses have of working in the aftermath was largely concerned with psychological issues. It was very surprising to find that only one nurse (N5) discussed the need to follow up physical injuries which could well cause the injured to need help, even with the most basic function. This nurse was working in home care and talked about that nursing in the aftermath of a disaster could mean in terms of helping out with almost everything. Furthermore, she was especially concerned with the patients who have lost their relatives who had been the main carer for them. She expressed her views:
" …it could be everything from injuries to mental help and support and some patients may have lost their relatives, there is a wide range of their needs" (N5).

Three of the health care leaders (LG2) pointed out that nurses should be able to discover if patients and also if colleagues need professional psychological help in the aftermath. One health care leader said: and they expressed this in the following manner:

"*… the nurses need to discover if patients and staff have problems dealing with what they have experienced and…..... in the psychological crisis teams, we have routine handling of this and debriefing"* (L1).

This is something that is not very well addressed as part of existing general nursing education so far and there is a consensus that it should form part of future disaster-oriented training in the future (see Chapter 6, Section 6.4).

Furthermore, the leader of a psychological crisis team talked about and suggested that there should be plans for following up people who have lost their loved ones and was very clear that they would go out to the people and ask them what they need, and reference them further in the health system if needed. She also talked about the importance to cooperate with other health care services and other parts of the municipality in order to help people in the aftermath. On the other hand, one leader of the municipal health department saw the importance of counselling and debriefing of personnel in the aftermath as this could help nurses to learn from what happened instead of living with an ache inside.

Finally, another leader elaborated about the importance of management to ensure that staff are not overburdened and tired once the aftermath stage is reached. This leader from a nursing home unit thought it was important to have a plan for how and when the nurses should work in a disaster situation. She thought that nurses who had been involved in the response phase of a disaster, must rest to be able to do their work again. In the meantime, this leader will use nurses she has, "saved ", who had not been working in this phase to work. Interestingly, this leader did have a clear focus on how to use the most important resources she had in a disaster event, the nurses. It is a matter of managing the resources rural municipalities have so they are spread and last through all of the disaster phases.

5.6.1 Summary

This final category presented the participants thoughts and opinions about what they think are important work to focus on in the aftermath of a disaster. As shown in Table 5.9 the mental health of the inhabitants and the health care workers was something that several of the nurses (NG1) and the leaders (LG2) highlighted. There is a consensus here for future attention and action (see Chapter 6, Section 6.5 and Tables 6.3 and 6.4). However, it was revealed that the implication of their work in a disaster was also to learn from the

event in order to be better prepared next time. Table 5.9 shows the participants response on what they think is important to consider when nursing in the aftermath.

Table 5.9 Nursing in the aftermath of a disaster

Nurse	Response	Leader	Response
N1	Debriefing but also caring for colleagues. Further caring for patients and in that case, it will be a need to strengthen the personnel.	**L1**	Nurses should have knowledge to see if people will need more professional help in the aftermath. Both patients and colleague.
N2	Be able to meet people in crisis and call in the psychological crisis team	**L2**	Important with debriefing and process the experience of what happened to be able to nurse again.
N3	Evaluate: How did this go? Were we well enough prepared? Did we manage the job? What can we improve? and be there for people in the aftermath	**L3**	Learn from the past.
N4	A space where we in the aftermath can seek for psychology help, if it is needing and follow-up in the aftermath	**L4**	Care for people with mental trauma and people with severe injuries
N5	Patients will need everything from follow up injury to Psychological support from us.	**L5**	You also need to let people go home to rest so they are able to take over the job after works, Not use all the nurses in the emergency phases you need nurses to do the job in the aftermath.
N6	Evaluation and debriefing. Follow up patients, relatives and health carers and leaders. We can't be some light that you turn on and off.	**L6**	I have seen what trauma can do to people so nurses need to be able to see the sign of patients and relatives need for professional help.
N7	Have an overview and think ahead and have a plan to assure people involved, relative's health care. Evaluate and debrief and let people talk about what they have gone through.	**L7**	Nurses are able to see if patients need more professional help
N8	Create calm and help people to communicate their need. Be there for the inhabitants with everything from care to food if needed.	**L8**	Taking care of relatives of our patients could be a challenge

The table shows the nurses response in the left column and the leaders' response on nursing in the aftermath of a disaster in the right column.

Chapter 6

Discussion

6.0 Introduction

The aim of the study is based on sub-arctic rural Norway and the demands and requirements of nurses and their roles in a disaster. The twin concepts of Disaster Nursing (DN) and Nursing in Disaster (ND) have been developed in Chapter 3 as two parallel and inter-related typologies. These concepts are compared with and discussed in the light of empirical data obtained by interviews of nurses and their leaders working in the rural municipalities of northern Norway (Chapter 5) and with reference to the literature review in Chapter 2 and forms the basis for this discussion chapter. A major question in any education for a profession is whether or not themes such as disaster should be part of the main stream education or to what extent it should be purely a specialisation.
The discussion chapter is answering this question using the following four key points as discursive lines of enquiry or discussion points:

- Is there a need for Disaster Nursing (DN) as a subfield in Norway or is it just nursing as usual but in a different environment "Nursing in Disasters - ND"?
- What are Nurses' leadership role in mass casualties and disasters?
- What are Nurses' involvement in rural municipal Disaster management teams, which in practise means what are Nurses involvement in municipal disaster management plans and health preparedness plans?
- What are the Nurses' experiences with emergency training and disaster exercises?

The first point relates directly to both the first objective and the first research question as given in Chapter 1, Section 1.7. The second and third point, cover different, but important aspects of the second objective and research question. It is clear from both the interviews and the literature that nurses were not in general considered or did not always see themselves as managers and leaders during disasters or mass casualty events. Consequently, the second line of enquiry was necessary so as to have a focus on this

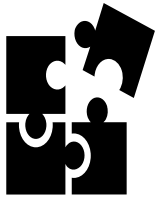
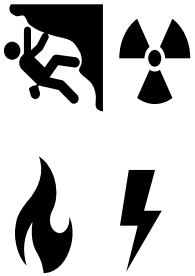
specific point whilst the third line of enquiry has a focus on the nurses' present-day involvement in planning and practise. The third objective has been answered through the development of the DN-ND conceptual framework as described in Chapter 3, and the last line of enquiry raises attention to actual experiences which will inform the recommendation for both policy and future education to facilitate better disaster nursing in Norway and this is summarised with definitive conclusions in Chapter 7, Section 7.1. A final contemplation on the research questions and objectives are presented in Chapter 7.2 in the section on 'Conclusions from the Research Questions'

The structure of this chapter is consequently based on four sections echoing the key lines of enquiry whilst the discussion within each section is outlined in Table 6.1.

It needs to be pointed out that Norway is a largely rural country with considerable distances between large centres which have hospitals as described in Chapter 1 in Sections 1.0 and 1.4 as well as further descriptions in Chapter 2. Disasters may of course take place anywhere and it is important that also small rural, near isolated communities should be prepared and have a high resilience.

Nurses represent a profession on which every health care institution depends, and their knowledge of how to nurse in a disaster situation will have an impact on the severity of the disaster on the inhabitants of a municipality. Consequently, do nurses need more specialisation that helps them dealing with a disaster (Disaster nursing - DN) or is it sufficient with a few disaster related topics in the mainstream education (Nursing in disaster - ND) as outlined in the conceptual framework of Chapter 3. With this in mind, the present chapter will also discuss the future requirements for disaster nursing in Norway.

Table 6.1 Key points for discussion of evaluating the present and future requirements of Disaster Nursing in Norway.

Key points		Discussion
Is there a need for Disaster Nursing as subfield in Norway or if it is just nursing as usual but in a different environment "Nursing for Disasters"?		Discuss future requirements for education using the empirical data with reference to literature and document study: • Nurses challenges and leaders' expectations, symmetry and asymmetry • Nurses and leaders view of disaster topics in nursing education. Symmetry or asymmetry. What level? • Nurses and leaders view on using media and technology Symmetry and asymmetry. • Nursing in the aftermath. Symmetry and asymmetry
What is nurses' leadership role in mass casualties and disasters?		Discuss future requirements for nurses' leadership using the empirical data with reference to literature and document study: • Nurses role as leader in mass casualties and disasters • Nurses role in disaster?
What are nurses' involvement in rural municipal Disaster Management teams; and nurses' involvement in municipal disaster management plan and health preparedness plans?		Discuss nurses' involvement in disaster management (DM) teams and involvement in municipals preparedness plans using the empirical data with reference to literature and document study: • Are nurses involved in DM teams? If not why? • Are nurses involved in some part of developing or reviewing municipalities plans? If not why? - Involvement in municipal overall disaster management plan - Involvement in municipal health care preparedness plan
What are nurses' experiences with training and disaster exercises?		Discuss nurses and leaders' experiences with training and disaster exercises with reference to literature review and document study: • Have nurses been involved in emergency training? How often? If not Why? • Have nurses been involved in disaster training? • How often? Why?

6.1 Is there a Need for Disaster Nursing as a Subfield in Norway or is it just Nursing as usual but in a Different Environment "Nursing in Disaster"?

6.1.1 Nurses Challenges and Leaders' expectations, Symmetry and Asymmetry

The results from the interviews of nurses and leaders regarding their respective challenges and expectations are presented in Chapter 5, Section 5.3 and they are also summarised in Table 5.2. The results demonstrate that there is both symmetry and asymmetry between the nurses (NG1) and the leaders (LG2) views and opinions.

The existence of an asymmetry between the challenges seen by the nurses and the expectations of the health care leaders is an important observation and it is summarised. in Chapter 5 by Table 5.2. In order to gain an understanding of the extent and depth the effect an asymmetry between the nurses and health care leaders would have, the interview study considered the nurses daily working challenges that could affect the nurses' emergency or disaster response. There is a clear asymmetry between the health care leaders' expectations that the nurses should be able to perform triage and the nurses concern about lack of training and education in triage especially in a disaster situation. Whilst it is clear that nurses have to deal with patients and make choices in general, the concern of the nurses is that in a disaster they may feel overwhelmed by a large number of severely wounded patients with very different and unusual types of injuries that they may not have previously experienced and which in addition might need specialist treatment. The nurses do not feel that their educational background at present cover such a situation. This concern is supported internationally by the design of a Korean educational program on disaster nursing (Huh and Kang 2019) which specifically included and covered disaster triage as an important topic. Given that the Norwegian nurses (NG1) did not have any disaster triage education as part of their nursing degree, it is very questionable if the leaders (LG2) are correct in thinking that the nurses should be able to deal with such an event based on the educational and training background that the nurses have at present (2021).

A resource causing concern both for the nurses and the health care leaders were the available human resources and available health care educated and trained human resources. Many of the nursing homes employ a large percentage of auxiliary nurses and staff uneducated in health care rather than registered nurses with nursing degrees. It

should be noted that this is in stark contrast to the cottage hospitals, which did not even accept recently graduated nursing staff. However, inadequate distribution of nurses is also reported as an issue in some international studies in many urban areas (Kayama et al. 2014; Pourvakhshoori et al. 2017a). The distribution and number of qualified nurses and staff without health care training causes problems in setting up timetables of work and work schedules so as to keep the required number of registered nurses available at any one time. This is underlined by a qualitative study of nursing in disasters where 15 Iranian nurses were interviewed (Pourvakhshoori et al. 2017b). It was found that a major problem with lack of educated nursing staff was that the educated staff had to work continually for long periods to provide service. Thinking ahead towards an emergency or a disaster, this may result in an insufficient number of registered nurses being available at any one time. This was one of the concerns of both the health care leaders and the nurses.

Furthermore, this points to the Conceptual Framework (DN - ND) proposed in Chapter 3, section 3.2 which suggests indicators and educational routes for nurses who may deal with disasters. Another important finding was that one nurse (12.5% of NG1) expressed her expectations that nurses should be calm and act during an emergency. It is also expected that nurses should take care of the emotional needs of the victims of a disaster, but it is in addition a necessity that nurses are able to care for their own emotional needs during the difficult situations that a disaster may create. One nurse (N2) commented that one should not let the feelings take control in an emergency and that a nurse in an emergency or in a disaster should act and think afterwards as outlined in section 5.3.1 and summarised in Table 5.2.

These findings contrast sharply with the contentions of some established works. A paper based on a study of thirty-two public health nurses who had worked in the March 2011 earthquake, tsunami and resulting nuclear accident in Fukushima, Japan (Kayama et al, 2014) suggests that helping and educating the nurses to express their emotions would be helpful and should give focus to their posttraumatic growth and support their mental hygiene. Clearly, the aftermath and emotional support of nurses is essential and should be part of any health care plan. In Norway, the tendency among local municipality nurses in remote, rural communities has been for them to be very self-reliant due to the lack of surrounding support measures and the distances to other health care centres or institutions. Because of their self-reliance, the value of talking and reflecting on disasters

may not be recognised by them as being a critical service both for them and the local community.

The results also reveal that the interviewed nurses presently do not feel adequately trained for disasters. At the very least, some of the interviewed nurses often regarded that their existing skills sets were not flexible enough. It is compelling to note that one nurse in the present study suggested that many of the nurses were not prepared or ready to be in a first responder role outside an institution. A possible explanation is that Norwegian nursing education up to the present academic year does not involve disaster nursing topics and that the nurses' focus is on working inside an institution, consequently nurses do not feel confident in responding to an emergency or a disaster outside an institution. However, the results did reveal a stronger self-confidence towards adapting existing skill sets among the municipal home care nurses interviewed. Several of the participating municipal home care nurses stressed that they had become used to new challenges through their working experiences. However, in nursing homes, the patients are frequently very old and may often have several illnesses so that nurses need to have very good medical skills and knowledge. This suggests that their fear of not managing as a first responder is unlikely to be because of their medical skills, it is more likely because they might be in a very unfamiliar environment.

Surprisingly, there was also a concern amongst the rural nurses that there was a lack of adequate provision of equipment, medical drugs and medical specific equipment. The results revealed a strong association by the interviewed nurses that the delivery of an effective disaster role and/or capacity required corresponding higher levels of equipment, drugs and specialised materials. It was particularly unexpected and surprising that a nurse (N7) from a cottage hospital was concerned with adequate supply of patients' beds as suggested in section 5.3.1.

Clearly the findings in Chapter 5 suggest that the study of disaster nursing cannot be divorced from wider resourcing issues which is not particularly well addressed in the existing literature. The majority of studies and papers are concerned with the preparedness of nursing staff and only a few papers discuss issues related to provision of equipment and explain the importance of the presence of adequate equipment for nurses to carry out their work (Kako and Mitani 2010; Knebel et al. 2012; Johal and Mounsey

2015). An example of such a study is Pourvakhshoori et al. (2017b) which states that resources including staff can be easily overwhelmed by the large number of people seeking help with acute injuries or help with prophylactic treatment. This clearly reflects and supports the Norwegian nurses concern about provisions in general and specifically in a disaster.

Moreover, it also reveals that in the case of Norway that any future movement towards enhanced disaster management of competencies of local community nurses (Nursing in Disasters) as well as any potential trajectory towards a specialist cohort of disaster nurses (Disaster Nursing) require progressive and escalating investment in equipment and resourcing. This is also supported in a wider study of public health nurses in a rural area of Brazil where the possibility that nurses in a disaster have to work with the lack of or damaged resources and equipment, was found (Menegat and Witt 2019). In the present study, one leader took quite a different or perhaps a supplementary view to the nurses in as much as she expected the nurses to make sure that provisions lasted until new supplies could be available. It should also be noted that current trends in logistics supports the concept of "lean logistics" and many municipal administrators adapt this concept (Wronka 2016) so as to reduce the amount of the municipalities' finances being tied down in storage. This is likely to be one of the reasons for having few provisions available. However, the nurses' concern about inadequate provisions is also supported by a very recent Norwegian Official Report (2019)[36], where they conclude that there is a need to improve the supply of medical provisions.

The focus and association on adequate levels of resourcing and equipment was perhaps not as well shared in the views presented by the nurses' leaders (LG2). It is the nurses' leaders' responsibility to have updated and sufficient supplies of medical provisions available in the case of disaster events taking place. On the other hand, to be able to fulfil this obligation there is a need to understand what kind of supplies are needed and the required quantities of these supplies. There will also be situations where nurses need to

[36] https://www.helsedirektoratet.no/rapporter/overordnede-risiko-og-sarbarhetsvurderinger-for-nasjonal-beredskap-i-helse-og-omsorgssektoren-2019/Overordnede%20risiko-%20og%20sårbarhetsvurderinger%20for%20nasjonal%20beredskap%20i%20helse-%20og%20omsorgssektoren%202019.pdf/_/attachment/inline/5ad6a6ec-4f67-4a6b-8e1c-75c88a9f1894:fd6f4e03a082c6e84895be990429e2cad29bcfba/Overordnede%20risiko-%20og%20sårbarhetsvurderinger%20for%20nasjonal%20beredskap%20i%20helse-%20og%20omsorgssektoren%202019.pdf

be able to improvise because of a shortage of available medical provision. This appears to be especially true for nurses working in municipal home care.

However, this lack of understanding has been highlighted in the present Covid-19 pandemic, where there have been many examples of both national and local medical stores being inadequately equipped (Fallon et al. 2020; Kirkevoll et al. 2020; Ranny et al. 2020). The shortage of personal protective equipment (PPE) in Italy resulted in health care workers experiencing high rates of infection and death (Ranny et al. 2020). The scenario of shortage of medical equipment in a crisis was also a concern by one of the leaders (L2) in the present study as discussed in the previous chapter. As shown in Section 5.3.2. and summarised in Table 5.2, this leader (L2) was afraid that it could take some time before new supplies arrived, therefore, she encouraged the nurses to use the equipment sparingly. In rural areas of northern Norway supplies can be a problem in severe weather conditions or if communications or network connections should fail. The differences in medical provision may create a challenge for disaster nursing training since there will be clear assumptions as to what a specialist Disaster Nurse might have access to and if there would be specialist equipment that might be need to be included if the requirement for better disaster nursing is recognised. On the other hand, it might also point to some training where participants learn to use what is available in the local, natural habitat in lieu of and whilst waiting for supplies, exemplified by course content described by Evju et al. (2020). Furthermore, a recent study of infection prevention and control at nursing homes during the Covid 19 pandemic, by Kirkevoll et al. (2020), demonstrates that there is a lack of competence related to disaster topics amongst Norwegian nurses (see Chapter 2, Section 2.3.1., Table 2.2). If nurses and their leaders did have better knowledge about the impact that different types of disasters would have and how to carry out nursing during such an event, the outcome could have been different. This has been put forward in an article by Fallon et al. (2020) where they comment on and discuss the need for more advanced care planning and improved provision of education for staff.

Some of the challenges that nurses (from NG1) highlighted (illustrated in Table 5.2) were their lack of knowledge related to disasters both specifically and generally together with potential dearth of equipment and facilities. The leaders' expectation about the nurses' readiness to deal with a disaster is surprising given the nurses low level of knowledge related to both the municipal health care plan and the disaster management plan as

demonstrated by Table 5.4 in Chapter 5, section 5.3.2. The leaders' opinions and expectations of the nurses in a disaster makes it clear that the present absence of both disaster related education and training is also a considerable preparedness and resilience concern especially as there is such a very strong asymmetry between the leaders and the nurses.

Furthermore, the study also shows that here was an expectation that the nurses should be collaborative partners with the leaders in a disaster as well as helping and supporting them to problem solve. This could be seen as yet another task, but on the other hand, if the leader would listen to the nurses, both parties would benefit and the above discussion further supports the need for improved education for nurses as suggested by the Conceptual Framework (DN - ND). Another important finding was that home care nurses were concerned that they would have to take on an emergency role as well as nursing their main patients. It seemed possible that the explanation is that as the law stands today, home care as an institution cannot refuse a patient and consequently, there is in principle no limit to the number of patients a home care unit may have to look after especially in a mass casualty or a disaster where hospital patients or nursing home patients could be sent home to free up places for casualties. It seemed that there were no plans to deal with such a situation. The problems associated with this type of dual role is seen from the study by Kayama et al. (2014) where interviewed public health nurses describe the conflicts between their prescribed roles and their responsibility to engage with the humanitarian situation on the ground.

This is in contrast to the expectations of the Norwegian health care leaders in the present study who required the nurses to have an overview and being able to change the situation (see Chapter 5, Section 5.3.2). A consequence of this expectation is that the nurses' education should also include and promote adaptive qualities as well as skill sets so that nurses can be better prepared to deal with unexpected and difficult situations as typically found in disaster situations. International authors comment on the myriad of duties and activities required in the public health care system and that they must be given sufficient resources so that nurses can handle a disaster (Richter 2010, p 395). However, there is a basic requirement of skills in ICN (2005) framework for Disaster Nursing that could be taken into consideration when adapting this to a Norwegian context.

The next challenge expressed by home care nurses was their lack of knowledge of how to care for patients who have been exposed to a disaster with trauma and spoke a different first language (different to Norwegian) and especially if they came from another and very different culture because it appeared that they were concerned about how an emergency could trigger effects from their previous trauma. These nurses felt that they needed further training and education which is supported by Plum and Meeker (2013, p 97) who suggests that specialist psychological help for dealing with trauma is important and preferably an early referral to psychological crisis team. Furthermore, understanding different cultures in a disaster situation is also shown to be important (Plum and Meeker 2013, p101). The expectations of the health care leaders are that nurses should be able to deal with such situations, and that they should know their limits and ask for supervision if they have problems. This asymmetry between the nurses' challenges and the leaders' expectations demonstrates a gap in perceived and actual competence of the nurses. This is reflected in Chapter 5, Table 5.3 which shows that neither leaders nor nurses had a single disaster related or disaster specific topic as part of their education.

A number of the nurses in the present study felt that they were not prepared for nursing in a mass casualty scene or a disaster scene, because it was a more acute or emergency type of role than they were normally used to. Furthermore, they were also worried about providing assistance, support and help in a manner that they had not prepared or trained for. Lack of preparedness was also the most significant finding from reviews of literature by Moradi et al. (2020); Baack and Alfred (2013); and Labrague et al. (2017), all concerned with the nurses' views. There was a symmetry with one leader of a nursing home unit, who did agree with the nurses. This leader did not think that the nurses would be able to carry out nursing in a disaster, thus indirectly suggesting that nurses would not be effective in providing nursing in disasters based on their present education. In a sense this is further support for the Conceptual Framework (DN - ND). On the other hand, Table 5.2 shows that the majority of leaders expected that nurses would act and that nurses would use their professional competence. Nevertheless, since the leaders suggested that nurses needed courses, training, have knowledge about routines, crises plans and ask for supervision, an interpretation could be that there were doubts among the leaders if the nurses were ready to nurse in a disaster (ND). This implies that nurses working in a rural municipality have a need for a more fundamental understanding of disasters in order to be prepared to carry out their work during such circumstances. Being prepared also means

to be confident when nursing in a disaster, and one of the leaders pointed out that giving nurses a disaster nursing education is building their confidence to deal with a disaster. This is underlined by the study of Li et al. (2015) of registered nurses having worked in an earthquake zone and other studies such as Wenji et al. (2015) who interviewed registered nurses after two major earthquakes and Charney et al. (2019) studying disaster competencies amongst health care students.

One unanticipated finding was that only one leader mentioned the important ethical aspects of nursing. Ethics is likely to be especially relevant and important in the turbulence of a disaster. Indeed, several studies mention the ethical dilemmas that nurses encounter during a disaster situation and that disasters put nurses in a place beyond the normal scope of their activities and previous experience as exemplified by both Kayama et al. (2014) as well as Pourvakhshoori et al. (2017b).

6.1.2 Nurses and Leaders View of Disaster Topics in Nursing Education. Symmetry or Asymmetry. What Level?

None of the nurses could remember having studied disaster nursing as a subject or any topics related to disaster nursing during their BSc (see Chapter 5, Table 5.3). This is also confirmed by the Norwegian syllabus for BSc in nursing up to 2019 which records no subjects or topics related to disaster nursing (Chapter 2, Section 2.3).

However, the recent government guidelines for the syllabus to be available for the present academic year (2020-2021), suggest that nursing students should have knowledge about measures to preserve life and health in mass casualty and in crises- and disaster situations (Ministry of Education and Research, 2019), but there are no new postgraduate courses in Norway or any proposed outlines or frameworks for such studies focusing on disaster nursing. It is interesting to note that despite the Norwegian government's guidelines for the nursing education program specifically outlining knowledge about the above disaster topic in the Norwegian BSc Nursing academic year 2020 - 21 Guidelines for Norwegian Nursing Education, 2019, §6e[37], there are differences between the Universities and their implementation of this topic as shown in Chapter 2, Table 2.2. A possible explanation for this may be that the guidelines are just an overall view of topics and that the actual

[37] https://lovdata.no/dokument/SF/forskrift/2019-03-15-412.

contents should be up to the universities to decide. On the other hand, only three of the bachelor nursing curricula did not include a disaster topic in their framework or study plan at all, and furthermore three of the education programmes did not include this topic in their framework or study plan for the first year of the BSc. These findings are rather disappointing especially since this framework has in recent years been developed at the universities nursing departments during the worldwide Covid-19 pandemic. However, this finding also shows that there is work to be done to highlight the importance of disaster topics among academics employed in nursing education and who are involved in developing the framework. The lack of nursing academics' interest in disaster topics is found to be not only an issue in Norway, but it is also found by studies in other countries such as Jordan (Alkhalaileh 2020) and these findings suggest that to develop Disaster Nursing there needs to be more research done by nursing academics in this subject area.

The changes to the education advocated by the nurses and the health care leaders are listed in Chapter 5, Table 5.3. The table includes both disaster nursing topics as well as the suitable educational level for disaster nursing studies. The results of the interviews show that the disaster nursing competencies proposed by both groups of interviewees (NG1 and LG2) can be broadly divided into two areas, management competencies and medical/clinical competencies. This is coincident with the explanation of Kalanlar (2019) for the development of the concept of disaster nursing being due to working conditions in disasters necessitating a certain level of knowledge about disaster management. There are some differences in the levels that nurses and leaders think appropriate for disaster nursing education. It is seen that the majority of the nurses want disaster nursing education to be present in the Nursing BSc as well as being included as a specialist postgraduate education, thus giving support to the DN – ND framework as proposed in Chapter 3. This coincides and is in symmetry with what the majority of the leaders want as part of a disaster nursing education. All of the participants agreed that disaster was an important topic and had to be included in a nursing education. Several studies support this view; Grochtdreis et al. (2016), propose that there should be a careful choice between specialisation and generalisation of skills and knowledge for undergraduate and postgraduate nursing education, whilst Kalanlar (2019) suggests both undergraduate and graduate disaster nursing education.

Advanced first aid, emergency medicine and observations were the disaster topics that the majority of nurses wanted to include in nursing education as shown by the results in Chapter 5, Table 5.3. The health care leaders also want nurses to be able to deal with most types of emergency or acute medicine. This very strong symmetry between the leader group (LG2) and the nurses' group (NG1) supports the concept of topics pertaining to emergency and acute medicine should be part of the syllabus offered by the DN – ND framework. In terms of medical and clinical skills, it is proposed that advanced first responder courses should be offered as part of a MSc course. This shows leaders want nursing education to include leadership and thus possibly Disaster Management topics. It should be noted that nurses have some management courses during their studies to enable them to manage health care units as shown in Chapter 2, Section 2.5 and Figure 2.7. Different and additional types of leadership and management skills are required in the chaos that is likely to be part of a disaster. This should include knowledge of when to call for specialist advice, support or expertise when required.

Knowledge about how to make the severely injured comfortable while waiting for treatment represents also a group of topics that are relevant. In Norway, and in particular during the winter season there is always the possibility of frost damage to people having for example lost their home and having no shelter. Situations of that type are very likely; thus, it is also proposed that learning how to deal with and treat frost damage should be part of a post graduate education.

Unique information from the present study is the difference or asymmetry between the nurses and health care leaders' views in terms of education. The nurses appear to want a larger focus on professional skills in a syllabus, which is also supported by the leaders and the nurses feel vulnerable perhaps without having trained or practised in any of the clinical or medical skills that they feel are important. Few nurses appear to think that new leadership skills are important for them in their work, whilst the leaders consider this to be important, something that is supported by several authors; Veenema et al. (2016); Jonson et al. (2017); Couig et al. (2017). A lack of exercises or training during education means that nurses are not exposed to situations that emulate disasters and demonstrate the need for disaster management skills. The gap has to be addressed in the education of nurses and was expressed by one of the leaders (L8) in terms of needing exercise in cold

conditions not only in a warm house. This is discussed in Chapter 5, Section 5.4.4. and demonstrates a real absence of relevant training and exercise for the nurses.

Another concern expressed in the study was mental health problems. One of the leaders proposed that students should learn more about mental health problems related to disasters both for victims and their families as well as nurses own mental health. Authors such as Benedek et al. (2007); Bahrami et al. (2014) and Li et al. (2015) emphasise the importance of education in mental health; and points out that the severity of human psychological responses varies with the characteristics of a disaster.

Learning about the municipal crisis plans and learning how they influence the nurses work in a disaster, as well as, planning and drawing up plans is part of preparedness for both emergencies and disasters (Kalanlar 2019). This was also suggested by nurses and health care leaders in the present study as an important part of disaster nursing education In order to reinforce disaster nursing competencies, both nurses and leaders suggest that simulation and training should be part of the disaster nursing education. There have been some recent studies investigating the effect of disaster nursing educational programmes on nursing competency and preparedness (Kalanlar 2019; Huh and Kang 2019). Both studies show that disaster nursing educational programmes have a significant and positive effect on disaster nursing competencies. In terms of actual course content, one of the studies recommends that core nursing, roles such as disaster triage and advanced first responder should form the backbone of a disaster nursing course together with planning and disaster management (Huh and Kang 2019). These were also the study contents that the nurses in the present study wanted to include in a disaster nursing education. It was suggested by one of the leaders to use simulations to practise the plans and one of the nurses wished for more emergency simulations. Simulation exercises are promoted by many authors as a method to improve skills and increase self-efficacy of nurses (Jonson et al. 2017; Kulig et al 2017). The study by Jonson et al. (2017) demonstrates that even a comparatively short and basic computer-based simulation can be helpful in order to improve skills and self-efficacy. Given that several of the nurses who were interviewed in the present study felt uncomfortable about leading and taking control in an emergency and even more so in a disaster, good simulation exercises seem a way forward both as a part of the fundamental education or as Continuous Professional Development (CPD) and as yearly joint training of all rural nurses.

6.1.3 Nurses and Leaders View on using Media and Technology. Symmetry and Asymmetry

Many of the nurses (NG1 cohort) (50%) were sceptical of the use of media as a source for reporting or bringing out messages to the inhabitants related to an emergency or a disaster event (Chapter 5, Table 5.8). The nurses did not envisage it as their responsibility or job (and felt that to bring out information through the media was the responsibility of the leaders (87.5%). A possible explanation for this result may be the lack of knowledge or training of the nurses about how to handle the media in general and how to talk to the journalists in chaotic times as expressed by Woods et al. (2014). In a disaster, the information about what is happening and how the inhabitants should behave, is very important for the people living in the area and the media is an important tool and can help to bring order to a disordered scene according to Harley et al. (2010). Results show that leaders and nurses, even if there exists a municipal spokesman in local government, may have to talk to journalists and handle outgoing information from the scene where they are possibly the only health care personnel. Surprisingly, also the result from the interviews of the health care leaders (LG2 cohort) shows that the majority (87.5%) thought that media should be handled by a spokesman for the municipality and that contact with the media was not anything they needed to take care of or be concerned with. There was also another concern by one leader who was afraid that media instead of calming people in a disaster could create panic, especially if journalists misunderstood what was happening on the scene, as supported by Woods et al. (2014).

This low interest among the participants to deal with the press media could be seen as a result of lack of knowledge about how to handle journalists in an emergency. The reason for this is not clear, but it may have something to do with lack of information from the top leaders down to the leaders at the unit level, lack of knowledge among nurses and their leaders of crisis plans and its content and lack of knowledge of their role in a disaster. An interesting finding was that one of the nurses thought that it was her responsibility to keep the journalist away from a disaster scene. A possible explanation for this might be that the nurse wanted to focus on her work with the injuries without any interruptions. Another relevant explanation has an ethical focus, where the nurse wanted to protect disaster victims from the press and media. Reports from the emergency scene and thereby media exposure is common, and if possible, the exposure should be reduced according to Grigg and Hughes (2010, p 453). There are few possibilities of avoiding the press in such

circumstances, but nurses need to know how to shelter and protect victims as much as possible from exposure to the media, in order to prevent extra mental health trauma to survivors and their families (Grigg and Hughes 2010, p. 453). On the other hand, the profession of the journalist has a duty to tell the story of an emergency or a disaster. Consequently, they will be early at the scene; therefore, first responders need to be able to handle the media. This is especially true in rural areas where nurses may be the first health care personnel at the scene and it is important to take this into their education so that they learn to handle the press and media in situations with a mass casualty emergency or in a disaster (Woods et al. 2014).

In the literature review it was mentioned that the use of social media with the photographic and video capabilities of smart phones has been criticised and has also caused ethical issues. It could give rise to considerable and overwhelming fear and panic according to Woods et al. (2014). Among the participants of the current study (NG1 and LG2 cohorts) there was a considerable scepticism of using social media in emergency or disaster situations because of ethical reasons (Table 5.8). Some of the interviewees even wanted to forbid or prohibit use of social media at an emergency scene. However, social media is something that has to be taken seriously and taken into the consideration. There also needs to be a plan for who, when and where information is brought out to the public. To effectively distribute information to the public there needs to be a municipal spokesman who is able to collect, coordinate and distribute information to the correct media (Harley et al. 2010, p 106). This is supported by a report from the "Viking Sky" incident which suggests establishing such a media centre would have off-loaded the information burden that the rescue teams experienced [38]. Unfortunately, this is not the case for private people and that represents a challenge that will also be there in the future. This is a topic that needs to be considered in a nursing education syllabus.

Using technology such as iPads, mobile telephones and computers have become a necessary tool for nurses working in rural municipal health care systems. There has been a rise in recent years of new technology that could improve post disaster management of victims' health as pointed out by Wong et al. (2016). Medical sensors and Skype or Zoom type consultations with remote doctors could be of considerable help in rural areas

[38] https://www.nrk.no/mr/pressekonferanse-om-_viking-sky_-1.14585289

according to a study by Hu et al. (2015). Although, the present study shows that there was scepticism among the nurses of using technology in disasters. They were especially concerned about failure of electrical or internet supply that would have impact on their work. Losing electricity and the internet in a disaster situation was also a problem the majority of the leaders pointed out (LG2 cohort). A possible explanation for this may be the fact that in Norwegian rural areas the electricity supply could be unstable because of adverse weather conditions and when something goes wrong it takes time for the engineers to find, locate and fix the damage (also due to the weather conditions) something that could escalate in a disaster. However, failure of the electricity supply may have solutions such as a battery back-up, thus nurses can continue to do their job out in the field if such precautions are taken.

The problem with recording the medical data for the evacuees from the "Viking Sky" incident as reported from the "Viking Sky" incident by DSB (Evaluering av "Viking Sky" hendelsen, DSB 2020)[39], suggests that there should be software compatibility between all the emergency services and also that nurses should be trained in using this technology[40]. The proposal sounds very logical, but raises the question about the level of technology that needs to be part of a nurses' education in the future and in particular for the future syllabus content of the proposed DN – ND framework. The incident demonstrated also several issues with the use of modern technology in disaster situation[40].

Amongst both the nurses (NG1 cohort) and the leaders (LG2 cohort) there were also ethical concerns about using technology. One of the nurses was uneasy about what extent technology takes over from human observations of the patients. This concern may be explained by the fact that if the technology-based methods take over from nurses' observations and practice in the day to day work, this could affect nurses' observational skills and reduce the nurses' confidence in responding to a disaster. Compatibility problems between the different technological solutions in the health care system resulted in problems to get hold of up-dated health information of patients and would affect nurses' work in emergency and disaster situations. The fear of failure of computer

[39] https://www.dsb.no/rapporter-og-evalueringer/evaluering-av-viking-sky-hendelsen/

[40] https://www.nrk.no/nyheter/cruiseskipet-_viking-sky_-1.14487440

programs was underlined by one of the leaders (L4) who wanted nurses to be prepared for such a problem in emergency situations. Rural municipal vulnerability could be reduced if local Government could find a solution for this health care system problem and thereby strengthen the nurses' work and their ability to respond in a mass casualty emergency or in a disaster.

The leaders (LG2 cohort) however, had a more positive response to the use of technology such as iPads or mobile phones for nurses to have access to documents in their daily work but also in an emergency situation. Technology could be very useful for responding to emergency or disasters in many ways. One leader (L3) suggested the use of drones in disasters to deliver medicine to places where the home care nurses could not reach the patients. Again, considering Hu et al. (2015) who suggested that to improve the health care response and the post disaster management of victims' health, medical sensors and Skype type consultations with remote doctors could be of considerable help. Consultation like this with remote doctors is something that nurses are familiar with, and it is used in many rural community health care systems.

However, it is a concern that the nurses who are in the front-line health care as professionals should be able to handle such equipment and there are real concerns among municipal nurses about their access to key information, and disaster related communications at important times in their jobs. Indeed, this may well require specific training of nurses, but it could be very valuable especially in all the remote parts of Norway and must become part of the syllabus for the proposed DN – ND framework.

6.1.4 Nursing in the Aftermath. Symmetry and Asymmetry

The mental health impact of a disaster was a concern among all of the participants. There was a symmetry between the nurses and leaders on the importance of been able to care for patient's mental health after a disaster. Any disaster will cause people to have a mental health burden because of the unpredictable nature of disasters and the results show that the participants in this study saw the need for nurses to be able to respond and include psychosocial support. This need for psychosocial support of disaster victims is underlined by a study from Japan nine months after the earthquake and tsunami in 2010. The study that was carried out among residents from Hirono in Fukushima indicate that depression and post-traumatic stress disorder (PTSD) were relevant among the survivors (Kukihara

et al. 2014). Another study among public health nurses responding to the same disaster show that they felt unprepared dealing with trauma survivors (Kayama et al. 2014). In the present study, response from nurses indicate more confidence in how to help patients with mental health problems. Nevertheless, there were differences between the nurses about how to handle the patients' psychological need for care. Home care nurses' response was that they must be able to meet people in a crisis and involve the psychosocial crisis team if necessary. In contrast, nursing home nurses wanted to increase the number of staff after the event so they could have more time with each of the patients. It may be that nurses who work in nursing homes know their patients well and the patients know the nurses. Since a number of elderly patients living in care homes are vulnerable, and many of them have dementia thus unknown people from outside such as members of a psychosocial crisis team could increase the patients' anxiety. On the other hand, some of the patients could benefit from talking to the psychosocial crisis team. The results show that it may be more relevant using the psychosocial crisis team for patients in home care. Nurses' ability to see if people will need more professional help in the aftermath of a disaster was expected by some of the leaders. Veenema and Thornton (2015), also identify that one of the nurses' roles is to provide psychosocial support, be able to respond and care for these people. Another interesting finding was that the patients who have lost their relative who have been their main carer in a disaster, seem to be a challenge to support. There could be several possible explanations for this result. Firstly, this may be a challenge for nurses, especially those who work in home care where the time resources are limited to deal with psychological effects, such as sorrow, which takes time to treat and heal. Secondly, nurses have through their basic education some topics that involve caring for people with sorrow and other mental problems, but the depth or the level of knowledge may not be sufficient for severe cases. Nurses may feel that they do not have enough knowledge, especially caring for people who have lost their loved one suddenly as in a disaster (Wenji et al. 2015).

In the aftermath of a disaster, it is a time for all who have been involved to think through the event and consider their performance. Learning the lesson was a common view amongst the participants from both the nurses' and the leaders' group (NG1 and LG2). In the current study, evaluation and debriefing was expressed by the participants as important in order to be able to move on, as shown in Chapter 5 by Table 5.9. The importance of having a chance to express their feelings was also highlighted in a study of

municipal public health nurses' experiences from a disaster by Kayama et al. (2014). During the focus group interviews several of the nurses reported that this was the first opportunity they have had to express their feelings and they felt that this approach helped them process difficult feelings and grow as a professional (Kayama et al. 2014). Going through the event in the aftermath of a disaster in order to improve the units` ability to respond was suggested by some of the leaders and by some of the nurses. One from the leaders' group (L1) strongly recommended debriefing in the aftermath of a disaster as a necessity in order for the nurses to be able to return to nursing again and additionally one leader of the municipal health department (L2) saw the importance of counselling as well as debriefing of personnel in the aftermath. The mental impact that a disaster has on nurses and other professions involved, was viewed as an important consideration by both nurses and leaders as being able to help colleagues who may have a need for care, support and counselling. The same understanding of a nurses' role has been highlighted by Veenema and Thorton (2015), suggesting that nurses should seek psychological help for themselves if needed, in order to be able to help others. This coincides with the opinion of three nurses from the present study (N1, N6 and N7) who pointed out that counselling and debriefing of staff and survivors was important. It was also expressed that the number of personnel must be increased to meet the need for mental caring in the aftermath of a disaster also to support those who have not been directly affected but will also have a need for some support. Debriefing was thus, put forward as an important part of tasks that nurses should participate in during the aftermath of a disaster according to data from the present study (Table 5.9). Debriefing is something that is not very well addressed as part of existing general nursing education so far and amongst both groups (NG1 and LG2) there is a consensus that it should form part of disaster-oriented education and training in the future and clearly then as part of the syllabus for the DN – ND framework. However, as expressed by Ranse and Zeitz (2010, p. 76), debriefing sessions must not be in the form of criticism, instead they should be in the context of lessons learned. Nevertheless, victims of a disaster will need psychological first aid and not debriefing as explained by both Meeker et al. (2013, p.114), as well as, Grigg and Hughes (2010, pp. 459-460). Debriefing is important for the professionals, but victims need psychological first aid. Disaster nursing education should take this into account as in rural areas, nurses may be the profession with most access to different parts of the municipal health system, therefore, they should be at the forefront to give psychological first aid to victims along with the psychological crisis team. Generating and designing a plan for taking care of those who

have been involved and for following them up was put forward by one nurse (N7) as shown in Table 5.9. Such a plan should also involve guidelines for the nurses' roles to follow up and support both victims and personnel in the aftermath. This concept is supported by Wong and Li (2016) in a study based on the aftermath of the 2014 Yunnan Earthquake, they question the current practice of temporarily teaming up disaster relief professions and suggests that making both short term and long-term plans to deploy appropriate health care professionals will serve the affected community in a much better way. Another important finding was that one leader, of a nursing home unit (L5) wanted to ensure that staff are not overburdened and tired once the aftermath stage is reached (Table 5.9). Sato et al. (2016), reports from nurses' experiences from the Great East Japan Earthquake and demonstrates the poor and extreme conditions that nurses had to endure, resulting in extreme tiredness and exhaustion. Consequently, as suggested by the nursing home leader (L5), it is important to ensure that staff are not overburdened.

Contrary to expectations, only two participants discussed the need to follow up physical injuries, one leader (L4) and one nurse (N5) pointed out physical injuries as an important consideration. It could be possible that this is due to the fundamental functions that nurses are supposed to carry out, and therefore they did not talk about it because it might have been an obvious function for them. Nevertheless, planning for transporting, stabilising and supporting victims with physical injuries is an important part of disaster preparation.

6.2 What are Nurses' Leadership Role in Mass Casualty Events and Disasters?

The result of the present study shows that the majority of participants think that nurses are able to lead in a mass casualty event or disaster provided that they have knowledge and training (Chapter 5, Section 5.5.1). However, some participant nurses (NG1) highlight that not everybody is able to take on a leadership role in a disaster. It seems possible that this is due to lack of professional and personal confidence. Notwithstanding, the findings have important implications for the implementation of a ND-DN framework. Presently the situation among local municipality nurses in Norway provides the rationale for investment in either or both of the ND or DN routes according to the conceptual model described in Chapter 3. There is a demand there that certainly fits Stage 1 of the model and is supported by some leaders (LG2) who thought that nobody could lead without knowledge and education as demonstrated in Chapter 5 by Table 5.7. It is stressed in the

literature that disaster nursing and management education for nurses will lead to positive outcomes such as reduced mortality, improved health services and reduced costs associated with disaster, (Kalanlar 2019). Clearly, the leadership role of nurses is important in mass casualty and disaster events as reported by Wenji et al. (2015).
Surprisingly, several of the nurses and one leader did not think that nurses were able to lead in a mass casualty emergency or a disaster. There are several possible explanations for this result, firstly the nurses expressed that they did not have the knowledge about how to lead such an event which is very different from the daily health care leadership that nurses carry out. Secondly, leading in a disaster requires regular training and exercise something that was definitely lacking amongst the nurses in the present study. Arbon et al. (2013) affirms that practising a disaster plan regularly increased the nurses' confidence in themselves and in management. However, a further reason could also be that the nurses presently feel the need for better education or training. This assumption of an educational gap needed to build confidence does again support the concept of the DN – ND framework education in Norway to enable nurses to lead during such circumstances. Education in this context also means gaining knowledge about when to contact and call for specialist competence and advice. Apart from that nurses would need leadership training, the nurses thought they have some basic or fundamental knowledge of leading based on their nursing education. Another explanation came from a home care nurse (N4), who pointed out that the independency of their work in home care had strengthened their ability to lead (Chapter 5, Table 5.7). Nevertheless, more education, training and experience is needed to give nurses confidence to lead in a disaster.

However, internationally it is pointed out that nurses' leadership role in a disaster is a necessity according to Powers (2010, p. 7). In a disaster, nurses should use their experiences and knowledge in coordinating both human and equipment resources as well as interacting with other services to refine the response effort (Powers 2010, p. 7) especially in rural communities where nurses have most insight into the inhabitant's health issues and organisation of the local community. A support for the above view may be seen in the aftermath of the Utøya atrocity where it was found that there were geographical differences in the health assistance provided, whereby a lower proportion of survivors in Oslo received proactive follow-up compared to the country as a whole, the difference being from 66% in Oslo to 98% in the districts (Wistrøm et al. 2016).

Together with the results shown in Chapter 5, Table 5.3, this demonstrates that leadership is a necessity in disaster nursing education and training.

6.3 What are Nurses' Involvement in Rural Municipal Disaster Management Teams; and Nurses' Involvement in Municipal Disaster Management Plans and Health Preparedness Plans?

One unanticipated finding of considerable concern was that a large proportion of the nurses did not have any knowledge of their overall municipal disaster management plan or its content. Awareness and consultation on plans are requirements of the proposed DN-ND framework (Chapter 3) and these findings clearly support its implementation. To ensure consultation and participation in the development of the plans, it is also necessary with some nurses following the DN leadership functions of the DN route. It would be expected that the DN educated nurses would form a small leadership cohort of DN at a municipality.

Given the importance of the plan, the lack of knowledge is at least surprising. This suggests that the disaster management plan is poorly communicated to all of the nursing staff. Slepski et al. (2013, p.39) states that nurses' participation in the planning processes and knowledge of plans is necessary to prepare nurses for leadership and the present results are thus very disappointing. A small proportion of the nurses had some local involvement in the plan, and then only from just starting to become involved with the plan to being involved in analysing some local hazards. However, one nurse (N7, Chapter 5, Table 5.4) was involved in the risk assessment part of a local municipality plan. Even so, such a result is also very disappointing, nursing involvement in the development of the overall disaster management plan will give considerable relevant local knowledge and allow nurses to bring their expertise to the table, (Veenema and Thornton 2015) especially as they are some of the major participants in the execution of the plan. Another paper, Knebel et al. (2012), makes it clear that nurses will be a major component of the frontline response to any disaster and that nursing involvement as well as leadership in preparedness planning can be very beneficial during an actual crisis. This is further supported by the semi structured conference on the future of disaster nursing which in their recommendation strongly endorses the placement of nursing professionals in leadership roles in management of disaster functions, Veenema et al (2016).

The majority of the leaders in the current study did not know if nurses had any knowledge of the municipal disaster management plan (Chapter 5, section 5.4.2). The documentation related to the municipality instructions from the central government, Meld.St.10 (2016-2017) clearly states that the municipalities should prepare for risk and vulnerability reduction in local communities and ensure that the relevant resources are coordinated in order to reduce the damage in a crisis. One would expect that the nurses should be part of that coordinated effort. Nevertheless, a review by Labrague et al. (2017) demonstrates a lack of awareness in relation to institutional plans and uncertainty of nurses' role leaving many feeling incapable regarding the execution of a disaster plan.

The nurses in the present interviews (NG1) also demonstrated that only half of them (50%) had knowledge of the Health Preparedness Plan as shown by Table 5.4. In addition, nurses had little involvement in either the reviewing or participating in development of the Health Preparedness Plan (37.5%). Poor knowledge of the Health Preparedness Plan is another concern since this plan directly affects nurses and other health care staff. Nurses would be a significant part of the team executing the plan and it would also be expected that they should participate in the development of the plan. This again demonstrates that both plans are at least poorly communicated to nurses and especially to those who have no leadership position. The health care leaders all claim to have knowledge of the disaster management plan and the health preparedness plan (Table 5.5), but only one (L1) had been involved in the development of the health preparedness plan whilst three had been reviewing the plan, the other leaders had no involvement. This is in contrast to the results of May et al. (2015), who reported the results of a training exercise and found that managers had a high level of training and involvement in planning and policy for disaster management. Knowledge of the plans will help staff to deal with a disaster or an emergency in an efficient manner; consequently, it is surprising that nursing staff are not more involved in the preparation of the plans. Furthermore, involvement in the development of the plans will also help to make the plans more realistic and potentially more efficient due to amongst other things, the nurses' local knowledge. Kose et al (2020), describe a collaborative disaster simulation which was found to tax disaster preparedness and resources of local health care facilities, emergency medical systems, fire departments, media and disaster preparedness teams. The post simulation conference was very positive to the importance of the involvement in disaster preparedness planning in amongst others the health care facilities. This underpins the necessity of nurses being

involved in the preparation of the Health Preparedness Plan. Finally, the preparedness plans are regulated by law; the local Government has an obligation, Meld.St.10 (2016-2017), to ensure that all working in the health care system have necessary training to be prepared for a disaster.

The Conceptual Model as expressed by the DN-ND Framework in Chapter 3 supports the concerns and will address many of the issues that are communicated above. There is a clear demand to offset weaknesses in awareness and consultation around Disaster Management and Health Preparedness plans. This demand is accomplished and represented by Stage 1 and 2 of DN-ND Framework and it provides support for both the DN and the ND route. The results demonstrate a real need to enhance participation and leadership in ensuring that nurses are participating in the development of plans. To enhance the participation there will be a need for nurses to be trained in disaster leadership as well and this supports a strong link and support for the DN route. Accordingly, the proposed framework needs to be incorporated into nurses' education to deliver better quality assurance so that the municipal Disaster Management and Health Preparedness plans are not just created but that they are read, understood and commented upon.

6.4 What are Nurses' Experiences with Emergency Training for Disaster or Mass Casualty Exercises?

Disasters may take place anywhere along the coast, as was demonstrated by the recent near disaster in 2019 of the cruise ship "Viking Sky" with 1,373 people on board – 915 passengers and 458 crew. The present study shows that there is a considerable lack of emergency training and mass casualty and disaster exercise amongst the nurses that were interviewed. Chapter 5, Table 5.6 shows the results from the interviews concerning training and exercise experience of both nurses and health care leaders. The report from the "Viking Sky" incident by Norwegian Directorate for Civil Protection (DSB) (2020), shows clearly that Norwegian nurses were never considered in a leadership role during the whole of the incident.

The importance of nurses receiving emergency training and disaster exercise is highlighted by other studies (Grochtdreis et al., 2016; Labrague et al., 2017; Charney et al. 2019). First of all, these studies outline that nurses in rural districts are key players in

emergency, mass casualty or disaster response and it is assumed that nurses in general should establish disaster plans and coordinate disaster response. A recent exploratory German study (Grochtdreis at al. 2020) observed that nurses in Germany are not, but need to get involved in all aspects of disaster management as well as receiving proper education and training associated with disaster and participate in mandatory disaster drills which must be arranged for nurses.

It is both interesting and of concern to note, that of all the nurses in the present study, there was only one nurse who reported that she received regular emergency training. However, half of the nurses reported that they have had irregular training. A table giving reasons for nurses to participate in disaster training is given in Chapter 2, Table 6.2. (Grochtdreis et al. 2016) and the table is based on studies by numerous authors. In many of the present cases, this training was only linked to fire drill training or demonstration at the nursing homes. Furthermore, there was a wide range in the scope of the training as it varied from demonstrating and showing the location of the nursing home fuse box(es) to, in some cases, going through the complete procedure to train for evacuation of patients in the nursing home. It is difficult to explain this result, as much more training would have been expected, but high cost and possibly lack of resources are likely reasons.

Table 6.2 Reasons for participating in disaster training (Grochtdreis et al. 2016)

Description	**Contents**
Reasons for participating in disaster training.	Test and maintain disaster preparedness. Create awareness for disaster in general. Create awareness for physical and mental limits. Increase personal safety. Increase confidence in disaster management. Minimize emotional and psychological trauma.

The reasons are further supported by Ranse and Zeit (2010), Veenema and Thorton (2015) and Cuig et al. (2017) who clearly recommend that training and especially exercises are very important for nurses and health care workers. The nurses' requirements of training in order to be prepared for a disaster is essential, especially to be able to work under different standards of care according to a study by Pourvakhshoori et al. (2017b). In that

study, mass casualty or disaster exercises were missing in the experience among the majority of participating nurses. This lack of nurses' disaster training and exercise was also found in a systematic literature review by Labrague et al. (2017) and it also relates to the similar findings among the leaders in the present study. Moreover, it is reported from the "Viking Sky" incident (DSB 2020) that Norway does not have a Mass Evacuation Plan and that there have not been any large-scale exercises.

The DSB (2020) report supports the views of the nurses (NG1) that there was a lack of training in disaster preparedness and emergency management. This lack of evidenced exercising and the demands by nurses (NG1) for more exercises provides further rationale in support of the DN-ND Framework as outlined in Chapter 3. Additionally, this supports perhaps especially the DN route which includes leadership with disaster management competences, but it also supports the general enhancements given by Stage 1 and Stage 2 of the DN – ND Framework. Clearly, greater disaster exercising needs to have a stronger presence for municipal nursing in Norway.

The interviews with both health care leaders and nurses were conducted in several municipalities of Northern-Norway. The municipalities were spread across the northern part, some being quite isolated, whilst others were closer to smaller towns with a hospital, but all of the municipalities covered large areas. A possible reason for the lack of exercises might be because of the larger amounts of resources necessary for advanced exercise sessions covering large areas. However, the nurse (N7) who received regular training and exercise was based in a municipality that is located very far from the nearest hospital (about 200km by car). The other nurses interviewed were also based some distance away from the nearest hospital, but not as far away from the nearest hospital as the nurse who received regular training and exercise. It could well be argued that this municipality understood the vulnerability of its inhabitants being located so far away from a hospital and thus prioritised training of its nurses and also the experience that the nurses should have, through only employing nurses with some years of experience. Interestingly, the training that this nurse received was also jointly with the other local first responders. Citations from the literature show that, the lack of training and exercise among nurses reduces the effectiveness in an emergency response of a municipality and it also reduces the municipal resilience (Veenema and Thorton 2015).

Even more of a surprise is that the leaders (LG2) also reported a similar lack of training and exercise to that of the nurses (NG1). Half of the leaders reported to have received some kind of emergency training, but a quarter reported that this was fire training on par with the nurses (Chapter 5, Table 5.6). In terms of exercise experience, five of the leaders, lack mass casualty or disaster exercise experience whilst a quarter of the leaders report that their training is a table top exercise, also here there was a considerable difference in how advanced the exercise had been. Importantly, the leaders were recruited from different leadership levels and this may well be a reason for the variation in type of exercise offered. One leader of a health care unit was offered an exercise which was simply that the municipal administration called up with the aim to find out how many beds they could free in a nursing home. Another leader was the head of the health care department in a municipality and this leader was included in a tabletop disaster management exercise involving the heads of all the departments in the municipality and the leader of the county council. A tabletop exercise may not appear very sophisticated, but this type of exercise can nevertheless be very useful as reported by Jonson et al. (2017) both in order to improve self-efficacy and management skills.

Furthermore, the result also shows that there was a symmetry among nurses and leaders related to the lack of training regularity and type of emergency training that was received (if at all). The lack of training experiences among leaders may possibly be one explanation why they have not prioritised emergency training for the nurses and other health care personnel since their own training had not been considered important. Indeed, the findings that there was also room for improvement in exercising among interviewed leaders (LG2) also shows that the synergising of efforts in the realms of exercising are essential as part of any future enhancement of nursing education (Stage 2 and 3 of DN-ND Conceptual Framework). Indeed, it would be an essential part of any leadership education enhancement if a dedicated sub-field of Disaster Nursing was to further develop in Norway in the future.

However, as earlier mentioned, a possible explanation for these results could be that a larger exercise involving all municipal departments would result in a lot more planning work and a greater need for resources. Large exercises of this kind are the Local Government's responsibility to carry out and it is also the recommendation from the Central Government Meld.St.10 (2016-2017). There is also a need for more training

content in academic curricula as recently suggested by Charney et al (2019) who studied curriculum coverage of Disaster Management Competencies of 729 Health Care students and 72 administrators in USA. The study shows inadequate coverage of disaster management topics in their schools supporting the present findings. In addition, the present study indicates that nurses should receive more in-service training and this is suggested and thereby supported by many authors (Baharami et al. 2014; Veenema and Woolsey 2013). Given the cost and resources needed for the necessarily large exercises, there is an expectation that all emergency or first responder services should be involved in such exercises.

An example of an exercise that has not included nurses was carried out involving maritime northern part of Norway and based on the northern city of Bodø, (Magnussen et al. 2018). In this study all the emergency departments constituting "Search and Rescue" (SAR) were involved in the exercise with the exception of the medical department representing nurses. It is questionable why the largest health care group was not taken on board in such an important event especially since the surroundings of the city of Bodø, northern Norway is rural and sparsely populated. In these regions, it is the municipal home care and care home nurse that represents the medical profession. Unfortunately, the recent Government appointed committee (June 2020) to review the "Viking Sky" incident does **not** include a nurse or any other health care professional which suggests that nurses in Norway are not viewed as leaders or managers in Mass Casualties or Disasters. Furthermore, it means that the potential learning from a post-incident follow-up has been lost (Reddin and Macdonald 2016). This demonstrates that there is a lack of knowledge of nurses' work at many leadership and management levels. It also raises the question if staff involved with planning and managing such exercises know what type of work nurses do, or should nurses beg to be involved in such exercises? Even so it is very unfortunate that nurses were not involved in the large maritime exercise as described in Magnussen et al. (2018) and a need for local nurses to be involved in the large exercises when they are executed. This is especially true given that the present study shows that nurses and health care leaders lack the exercise experience that many authors; Knebel et al. (2012); Yan et al. (2015); Park and Kim (2017); propose that they should have both in order to manage better on a personal level and consequently to strengthen the resilience and preparedness of the municipalities where they carry out their work. The above

observations further support and strengthen the view of a clear necessity for the DN – ND framework in Norwegian education for nurses.

6.5 Summary

The discussion shows that many of the findings based on interviews of nurses and leaders from this rural sub-arctic northern Norwegian study concurs with actual experiences from other parts of the world that have been exposed to both natural and manmade disasters. Reports from recent emergencies and near disasters in Norway also underlines and amplifies some of the study findings.

During the last ten years, International organisations, notably WHO and ICN have clearly expressed the need for nurses to be part of Disaster Management Teams and contribute to Disaster Management Plans in order to make the societies exposed to emergencies and disasters become resilient. This study shows that these proposals are at present not taking place at all in Norway. On the contrary, Norwegian nurses are excluded from large training exercises and excluded from government appointed committees investigating recent near disasters with the potential of mass casualties.

Education of nurses takes place at BSc level and MSc level in most parts of the world inclusive of Norway. However, the syllabus and educational level for specialisations vary significantly between countries. In terms of syllabus content, the Norwegian nurses BSc syllabus has never previously included any reference to emergencies, disasters and mass casualty events, however, the new educational guidelines (academic year 2020-2021) includes a description of emergencies, disasters and mass casualty events and a discussion about how to deal with such events.

Discursive conclusions based on the key points (Table 6.1) for evaluating the requirements of Disaster Nursing in Norway are given in Table 6.3. The empirical data that has been uncovered is supported by international literature and shows that there is a need for a Disaster Nurse (DN) education, as a MSc or post graduate course which includes leadership and disaster management topics together with topics containing emergency medicine. In addition, there is also a need for improving the disaster knowledge and emergency medicine for nurses who will nurse in a disaster (ND).

Table 6.4 summarises findings on opinions outlined in Chapter 5, of both Nurses (NG1) and Leaders (LG2) in terms of present conditions and future educational requirements related to aspects of Disaster Nursing. Whilst there is asymmetry especially about nurses' present-day skills and knowledge together with use of technology, there is convergence on an overarching educational platform for nurses to deal with mass casualty and disasters. There is also agreement on specific and important issues such as debriefing, dealing with media, nursing in the aftermath, as well as, Disaster Management and Leadership. Thus, it can be seen as further agreement for a future educational platform such as the proposed DN – ND framework.

The majority of both nurses (NG1) and leaders (LG2) were of the opinion that nurses are able to lead in a mass casualty event or disaster provided that they have knowledge and training. Consequently, the future requirements for nurses' leadership must be based on given training, education and exercise. Nurses' leadership role in a disaster is a necessity according to international experience and publications. The present situation in Norway is rather disappointing; a large proportion of the nurses did not have any knowledge of their overall municipal disaster management plan or its content and only a small proportion of the nurses had some small local involvement in its development. The nurses (NG1) also demonstrated that only half of them had knowledge of the Health Preparedness Plan and had little involvement in either reviewing it or participating in its development. There was also a considerable lack of emergency training as well as mass casualty and disaster exercise amongst the nurses (NG1) that were interviewed. The leaders (LG2) also reported a similar lack of training and exercise to that of the nurses.

However, there are at present no holistic plans for the education of nurses to deal with mass casualty and disasters in rural Norway. The evidence presented in this thesis in terms of both international papers and interviews of front-line nurses and their leaders from rural, northern Norway propose that there are many issues to be resolved and that there are considerable educational, training and exercise needs for nursing staff in these regions.

The International Council of Nurses (ICN) and the World Health Organization (WHO) saw the necessity for building capacities of disaster knowledge and competencies for nurses at all levels that might experience a disaster. Towards this end the present study

focussed on the critical evaluation of the present and future requirements of Disaster Nursing/Nursing in Disaster using rural northern Norway. This resulted in the definition, concept and emergence of the Disaster Nurse (DN) as a leader and part of the Disaster Management team. This is a specific contribution, as are the specific educational requirements for nursing staff (ND) who might have to deal with disasters or in other words a DN– ND framework. The evidence that has been uncovered and is presented in the previous chapters supports the concept and framework which represents a holistic educational and organisational plan for dealing with potential disasters in rural northern Norway.

Table 6.3 Key points for discursive conclusions.

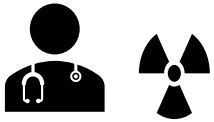
Key points		Discursive conclusions
Is there a need for Disaster Nursing as subfield in Norway or if it is just nursing as usual but in a different environment "Nursing for Disasters"?		The empirical data that has been uncovered based on both nurses' and leaders' views supported by international literature shows that there is a need for a Disaster Nurse (DN) education, as a MSc or post graduate course which includes leadership and disaster management topics in addition to topics containing emergency medicine. In addition, there is also a need for improving the disaster knowledge and emergency medicine for nurses that will nurse in a disaster (ND). This evidence that has been uncovered supports the necessity for the application of the DN – ND framework and concept as proposed in Chapter 3 which represents a holistic educational and organisational plan for dealing with potential disasters in rural northern Norway.
What are nurses' leadership roles in mass casualties and disasters?		Majority of the participants think that nurses are able to lead in a mass casualty event or disaster provided that they have knowledge and training. Consequently, the future requirements for nurses' leadership must be based on given training, education and exercise. Nurses' leadership role in a disaster is a necessity according to international experience and publications. Leadership also involves knowledge and understanding related to where and when to seek specialist competence about injuries such as those from biological, chemical and radiological hazards.
What are nurses' involvement in rural municipal Disaster Management teams; and nurses' involvement in municipal disaster management plans and health preparedness plans?		None of the nurses (NG1) were involved in the rural municipal Disaster Management teams. Disappointingly, a large proportion of the nurses did not have any knowledge of their overall municipal disaster management plan or its content and only a small proportion of the nurses had some small local involvement in its development. The nurses (NG1) also demonstrated that only half of them had knowledge of the Health Preparedness Plan and had little involvement in either reviewing it or participating in its development.
What are nurses' experiences with emergency training for Disaster or Mass casualty exercises?		There was a considerable lack of emergency training and mass casualty and disaster exercise amongst the nurses (NG1) that were interviewed. The leaders (LG2) also reported a similar lack of training and exercise to that of the nurses. This is despite the fact that many international authors propose that they should have training and exercise to strengthen the resilience and preparedness of the municipalities where they carry out their work.

Table 6.4 Future requirements for education using the empirical data with reference to literature and document study.

Discussion area	Majority of Nurses' View (NG 1)	Majority of Leaders' View (LG 2)	Symmetry or Asymmetry
Nurses challenges and leaders' expectations, symmetry and asymmetry	Lack of education, training and experience. Insufficient equipment and facilities. Concern about availability of supplies. Concern about communication.	Most leaders were expecting that education and experience enable nurses to deal with disaster, but not all. Knowing when to get help and support. Keeping an eye on supplies.	**Majority Asymmetry.**
Nurses and leaders view of disaster topics in nursing education. Symmetry or asymmetry. What level?	Both as topics in BSc and specialist MSc with both emergency medicine and disaster management and leadership.	Topics in BSc and specialist MSc with both emergency medicine and disaster management and leadership but also post graduate course	**Majority Symmetry**
Nurses and leaders view on using media and technology Symmetry and asymmetry.	Scepticism about reliability of technology. Concern about losing the human side of caring. Not assuming media role.	Upbeat about technology. Not taking information spokes-person role.	**Asymmetry on technology, Symmetry on media.**
Nursing in the aftermath. Symmetry and asymmetry	Debriefing important together with psychosocial support of victims and relatives as well as staff	Debriefing and give staff rest. Need for specialist education to see signs of trauma. Care for victims' relatives and staff	**Majority of Symmetry**

Chapter 7

Conclusions and Recommendations

7.0 Introduction

In the last century, the management of disasters has been a field of both academic and practical studies and recent work by WHO (UNISDR 2009 and UNISDR 20015) has given the health care aspect of disasters greater emphasis. It has become clear that nurses in particular are important in order to reduce the effect of a disaster on the affected population. This thesis has undertaken a critical evaluation of nurses' role in disasters and mass casualty events. The main aim has been *to critically evaluate the present and future requirements of Disaster Nursing using rural northern Norway as a case study.*

Rural northern Norway was chosen as a case study because the country as a whole represents an industrially advanced society with comparatively sophisticated health care provision and developed community (municipal) nursing services. The Gross Domestic Product per Capita (GDPC) has also had a robust growth in recent years and it is amongst the highest of the countries belonging to the Organisation for Economic Co-operation and Development (OECD). In terms of health care and nursing affiliations it is a member of the World Health Organisation (part of UN) and the International Council of Nursing (ICN). Norway is of analytical interest since it constitutes a diverse and rather sparsely populated country with large rural regions, such as the northern three counties, and it faces notable challenges in building effective community resilience.

This concluding chapter addresses four tasks; First, it revisits the DN-ND Framework introduced in Chapter 3 and offers insights through its application to the context of municipal nursing in rural Norway. In particular, it draws upon the key findings (Chapter 5) and discussion points (Chapter 6) taken from the literature review and primary research (16 interviews) undertaken in locations north of the arctic circle based in the three northern counties of Norway. Second, this chapter then addresses the three research questions underpinning this study. In the final two sections, the study is then placed in the wider context of considering a future research agenda and recommendations for practitioners.

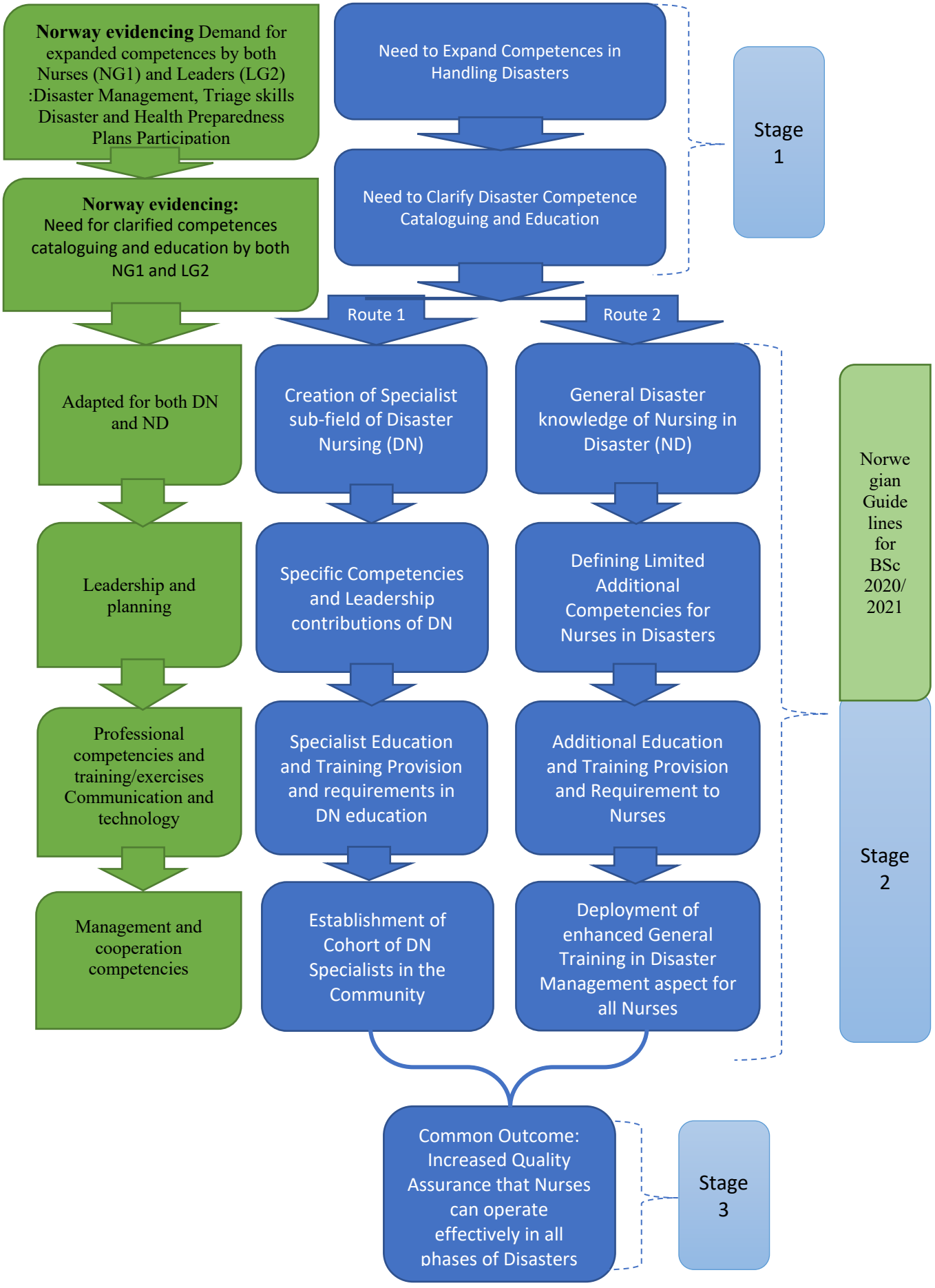
This study demonstrates that there are many challenges, some of a generic type, others

quite specific to the region, for Disaster Nursing in rural northern Norway. It is clearly recognised that there must be a change in attitude towards nurses and that their expertise and proficiency should be fully utilized through participation in for example the development of the Municipal Health Preparedness Plans and Municipal Disaster Plans Nevertheless, the study also uncovers and develops an approach for organizing and educating nurses in and for this region to deliver health care that will be required if a disaster strikes, despite harsh weather conditions, difficult transportation and large distances between health care centres of any kind. This approach is established from the Disaster Nurse (DN) and Nursing in Disaster (ND) conceptual framework, adapted to the regional conditions as well as adjusted to be of generic value using the contribution from the interviews of the nurses (NG1) and leaders (LG2).

7.1 Disaster Nurse (DN) and Nursing in a Disaster (ND) in Rural Northern Norway

In order to achieve the aim of the project, the DN-ND Conceptual Framework was introduced to understand the routes and processes for developing (more) effective disaster nursing arrangements and education as presented in Chapter 3. In particular, the DN-ND Frameworks provides a way of appreciating the challenges and considerations of developing and meeting both specialist Disaster Nursing (DN) and more generalist Nursing in Disaster (ND) requirements that are likely to provide enhanced quality assurance that nurses will be able to handle the onset of crises and disasters in their respective community setting more effectively. It was anticipated that the respective conceptual DN-ND typologies would also help to focus educational standards and provisions in relations to disasters. Figure 7.1 demonstrates the present situation in rural northern Norway from the perspective of the DN-ND framework. There is clear evidence that Norway is at Stage 1 of the model by the data from the interviews of nurses (NG1) and leaders (LG2). There is also evidence for the potential viability for both the DN and ND routes in Norway. Indeed, the evidence is strong in relation to the ND route through the general improvements to the proposed limited disaster skills of Nursing as shown by Figure 7.1. There is some evidencing for more specialist DN education and development, particularly in associating with nursing leadership, equipment and resources.

Figure 7.1 Conceptual Flow of the Typology for rural northern Norway



The conceptual framework for disaster nursing in rural northern Norway is based on indicators as shown in Table 7.1. These indicators suggest the topical content of the two different development routes. These routes in Norway will be near identical in terms of academic level to those proposed by the Conceptual Framework in Chapter 3. This is because higher education in Norway largely follows the Bologna agreement for higher education which means that the general nursing education (ND) will be based on the BSc Nursing and forms the second route whilst the DN education will be based on the two-year MSc of the Bologna system and forms the first route.

Figure 7.1 reveals that the conceptual Framework involves three stages; namely **Stage 1 (Need/Challenge/Identification)** leading to **Stage 2 (Development Routes) and then Stage 3 (Outcomes).**

The first stage; **Need/Challenge Identification** will include the fact that the new 2020 – 2021 guidelines for BSc Nursing in Norway includes that the students should: *"know measures to preserve life and health in mass casualties and in crisis-and disaster situations"* (translated from Norwegian regulation on national guidelines for nursing education §6 e). This means that disaster topics are involved in the current BSc, but not in terms of proficiencies only as knowledge. However, Table 7.1 reveals what both the nurses (NG1) and leaders (LG2) wanted, namely that the ND cohort should be able to give hands on support in Disasters in terms of Triage, Stabilising a patient, First aid and potentially more advanced First aid. The focus for the DN cohort was proposed to be Disaster Management, and Managing Nursing and Medical support - also to have an overview of nurses in the municipality through leadership techniques and methods. It is also proposed that DN during the MSc study should gain experience of important medical methodology and techniques, such as triage under difficult circumstances, knowledge about trauma due to disaster and treatment of psychological effects on both victims and all health personnel. Both the ND and the ND route should have an understanding of the effects that Arctic conditions and weather have on people, but it is anticipated that the DN route should be able to deal with the effects of Arctic weather and conditions on people and patients. However, and importantly, the DN route should also be able to motivate and initiate exercises and training related to disasters which this study has shown to be lacking for nurses of all categories in Norway.

In terms of **stage 2 Development Routes;** as discussed above one seeks to establish specialist Disaster Nurses (DN) and the other that seeks to improve the overall competencies of general nurses in disaster management through enhancement of topics within general nursing education (ND). The first route recognises that Disasters represent a new emerging specialist sub-field of Nursing where specific competencies and leadership contributions are very necessary and DN is a specialist MSc concept. At the Municipality level in rural Norway the second route leads to the definition of the additional and limited extra competencies and enhancements as pointed out above. The use of the DN competencies for initiating exercises and training related to disasters will help the application of enhanced general training and exercises in disaster management aspects for all Nurses working in the Municipality and Home Care Environment.

Stage 3 clarifies the **Defined Outcomes and Impact**. The most important of these outcomes is, first, the delivery of a permanent comprehensive educational and training strategy and secondly, increased quality assurance at the community and home care level that nurses can operate effectively in relation to disasters and all aspects of the disaster management cycle.

Table 7.1 Conceptual Indicators for rural northern Norway

Indicators:	DN - Disaster Nursing – MSc level	ND - Nursing in Disaster BSc level
Planning (Chapter 5, Sections 5.5, Tables 5.4, 5.5, 5.6)	Know the national disaster plans and the response required. Developing guidance for policies and ethics. Assess hazards, participate in all levels of the Municipal Disaster and Health Preparedness Plans. Facilitator for developing and reviewing preparedness plan Motivator, initiator and planner for exercises training	Educated to give advice on specific local conditions Up-dated on regulation and procedures Work in an ethical manner Knowledge about both the local Municipal Disaster Plan, the Health Preparedness Plan Participate in drills and exercises in the community. Evaluation of drills and exercises.
Leadership (Chapter 5, Section 5.4, Table 5.7)	Local knowledge of the environmental municipal challenges Evacuating vulnerable Responsibility for storage and supplies of resources and staff Lead and manage Nursing, Medical support and Disaster Management Reveal nurses' roles to leaders Secure aftermath health care Managing the de-briefing	Hands on support in Disasters : - able to see when to secure people - overview of inhabitants or patients Know who need health care at their unit. Lead at emergency scene. Knowledge of evacuation vulnerable Know the indicators to use special equipment such as PPE and other health emergency equipment. Participate in debriefing
Managing communication Chapter 5, Section 5.6.2, Table 5.8)	Cooperation with disaster teams to develop media message and familiar with disaster terminology	Give information to appropriate person and use disaster terminology & deal with journalist and media.
Social media (Chapter 5, Section 5.6.2, Table 5.8)	To develop message for social media.	Know where to find information.
Use of technology (Chapter 5, Section 5.6.2, Table 5.8)	Simulation for training. Updated knowledge of technology Knowledge of emergency communications system.	Simulation for training. Use technology in emergency and disaster situations. Emergency communication system.
Professional competencies **(Chapter 5, Table 5.3)** **(Chapter 6, Section 6.2.2)**	Outline important methods and techniques. Knowledge of how to preform disaster/emergency triage and work under difficult circumstances. DN can give advance first aid to people who need special treatment. DN can stabilise severe injured people before specialised help Terror such as CBRNE[41] exposure and methods for decontamination. Dealing with severe and Arctic weather conditions in a disaster. Knowledge about trauma due to disaster and treatment of psychological effects for all. Understand patients other cultures.	Highly skilled using equipment and be able to improvise if necessary. Triage, give advance first aid, stabilising injured people. Health care in difficult situation. Improvise with available resources Identify and care for exposure to CBRNE and decontamination assessment. Deal with Terror cases. Knowledge of mass immunisation and participate in the local program Give first psychologically care Familiar with how to refer victims and staff to specialist treatment. Understand patients from other cultures.
Cooperation competencies (Chapter 5, Tables 5.2 and 5.3, Section 5.7)	With other first responders and helping organisations Cooperation with DN in other municipalities	Cooperate with other professional groups and organisations. Assess need for resources and support through chain of command.
Experience (Chapter 5, Table 5.3, Table 5.9 and Chapter 6, Section 6.2.1	Triage in difficult circumstances. Dealing with severe and Arctic weather conditions. Treatment of Trauma and psychological effects	Highly skilled using equipment and improvising. Dealing with psychologically affected victims and health care staff.

[41] Chemical, biological, radiation, nuclear, explosive

There is a need for a review of the BSc and MSc Frameworks to take place to meet the completion of Stage 2. These aspects will be discussed in more detail in the following section of the conclusion that considers research questions, as well as, the section that considers research agendas and particularly recommendations for practice and practitioners.

7.2 Conclusions from the Research Questions

In chapter 1, the thesis outlined three research questions to facilitate the aim and objectives of this study. The overall conclusion to this study is that the results, findings, discussion and conclusions provide important insights in answering those research questions, particularly in the context of municipal nursing in remote rural communities of Norway. More specific considerations in relation to three underpinning research questions are offered below.

Is there a need for Disaster Nursing as a subfield in Norway or is it nursing as usual but in a different environment?

Nurses represent the profession on which every health care institution depend, and their knowledge of how to nurse in a disaster situation will have an impact on the severity of the disaster on the inhabitants of a municipality. Consequently, some of the nurses need more specialisation that helps them dealing with a disaster, leading the nurses during disaster conditions to collaborate with the other emergency services as well as making preparations within the community and ensuring that nurses are appropriately involved and positioned within the community (Disaster nursing - DN) as proposed by the conceptual DN – ND framework (Chapter 6, Section 6.2). In rural northern regions of Norway, in the small communities, nurses are often the health professional with the highest medical competence and given the extent of a disaster there will always be a necessity for all nurses in a municipality to be involved in assisting the community. To accomplish these tasks together with giving nurses both personal and professional confidence to deal with a disaster, as detailed in the previous section, it is necessary that education includes disaster related topics in the mainstream BSc education (as suggested in Chapter 5, Table 5.3 and in Chapter 6, Section 6.2). This should involve an

understanding of disasters and the role of nurses in such circumstances as well as appropriate emergency medicine topics (Nursing in disaster - ND). These requirements are also pointed out and presented in the above conceptual framework.

How are municipal nurses presently involved in Disaster Management teams and in disaster plans, especially in rural communities in Norway today?

The nurses that were interviewed (NG1) worked in different districts of rural northern Norway (see Chapter 5). None of these nurses were involved in their local rural municipal Disaster Management team. Disappointingly, unacceptably and astoundingly, the interviews revealed that a large proportion of the nurses did not have any knowledge of their overall municipal disaster management plan or its content (see Chapter 5, Table 5.4 and Chapter 6, Section 6.3). The analysis of the interviews also disclosed that only a lesser proportion of the nurses had some trivial local involvement in the development of the plan. It would have been expected that the nurses (NG1) had knowledge of the Health Preparedness Plan and as health care staff had been involved in developing and reviewing this plan. However, the analysis of the interviews also demonstrated that only half of the nurses had knowledge of the Health Preparedness Plan and again the nurses had insignificant involvement in either reviewing the plan or participating in its development. The awareness of nurse's lack of involvement was also uncovered when the researcher studied the prevalence of Norwegian local government disaster management plans (Holdo et al. 2017). These results clearly establish that municipal nurses or their opinions are not considered important by leaders and managers. Such standpoints or attitude by leaders, lack of assertiveness by nurses or poor organisation represents a major weakness which needs to be addressed. The effect of the existing situation on the municipality is that present day nursing is not delivering to its true potential. Furthermore, disaster preparedness will also be far less than its true potential and this may well put the municipality in jeopardy if a disaster strikes or if a mass casualty event takes place.

What future changes are required in nursing education provision in Norway to facilitate better disaster nursing in Norway?

At present there are no disaster topics in the syllabus for BSc nursing within Norway apart from in the recent 2020 – 2021 guidelines for BSc nursing which states that the student nurses should: *"know measures to preserve life and health in mass casualties and in crisis*

and disaster situations" (translated from Norwegian regulation on national guidelines for nursing education §6 e). However, there are no proficiency requirements in the existing educational offerings related to disasters in Norway. Present disaster nursing topics in Norwegian nursing education is given in Chapter 5, Section 5.4.1 which gives rise to the discussion in Chapter 6 culminating in Table 6.3. This leads to the DN – ND framework for rural northern Norway as proposed in the previous section. The overall conclusions of how this study reflects the above research question can be presented in bullet point format as below:

- Based on the results of the study there is clearly a need for disaster topics at BSc level both in terms of knowledge content and importantly also in terms of proficiencies. The required content is more specifically displayed in Table 7.1.
- A specialisation at MSc level is a clear requirement by both nurses (NG1) and leaders (LG2). This is demonstrated by Table 7.1, but this is also seen more directly from Chapter 5, Table 5.3,
- The syllabus for BSc Nursing involving disaster topics must be very similar for all Universities and University Colleges. The present review in Chapter 2, Table 2.2 demonstrates that the implementation of the government guidelines differs between the Norwegian Higher Education Establishments that provide BSc in Nursing.
- Student nurses should be involved in training for disaster and mass casualty events as part of their study. The dearth of such involvement by nurses is exposed in Chapter 1, Section 1.2 whilst the demand from nurses and leaders is disclosed in Chapter 5, Section 5.4.1.

7.3 Implications for Future Research

The present investigation has only been involved with rural municipal nurses in northern Norway. However, it is importantly made clear by the present study that nurses are not given any leadership responsibilities and they are not even consulted for plans that obviously should take their expertise and experiences into consideration during their development. The most important future research that is necessary is therefore to interview first responders such as:

(i) Participants from the police forces in rural northern regions

(ii) Participants from the fire services in rural northern regions
(iii) Participants from the political and administrative leadership of the rural northern municipalities and local governments.
(iv) Participants from the medical leadership
(v) Participants from the paramedic services
(vi) Participants with specialist medical knowledge of injuries caused by biological, chemical or radiological hazards.

The above participant groups represent those who have to collaborate closely with nurses in mass casualty and disaster situations. It is important for future planning that the views of nurses by the above groups are well understood so that if necessary, these groups can be given better information about the skills and experience that rural municipal nurses have. The analysis of the interviews suggests a mismatch between the outlook on nurses that these groups have and the actual competence and experience of rural municipal nurses. Furthermore, information from such interviews is equally important for the nurses in order for them to relate to an eventual mismatch in the perception of nurses' competence and experience.

Additional future and related research would be to investigate the application and suitability of the DN – ND conceptual framework in other regions. Typically, this could take place in other parts of Scandinavia, Europe and regions where natural disasters are prevalent.

There has been a focus of the present study on the northern most rural regions of Norway. While this is important, significantly and potentially represents the regions with the greatest challenges, the present research could be expanded to include comparable studies of other regions of Norway which would supplement the present findings with their results. A comparative analysis of other countries in Scandinavia would also be of benefit.

However, importantly for Disaster Nursing, the concept and findings herein could be applied more broadly to other nursing systems say both in the developed and developing world. Consequently, the present study can be seen as a pathfinder study for Disaster nursing. Clearly, the differing countries will have differing health care systems and organisations, differing crises and disaster leadership and management methods as well as differing higher educational systems. Accordingly, whilst the conceptual DN – ND

framework as presented could still apply, further work and research could thus be placed on the determinants of the DN and ND routes and the relationship between them in the different systems and organisations to strengthen general resilience.

7.4 Recommendations for Nurses and Future Nursing Practice in Norway and beyond

The present study implies that overall preparation and mitigation of a potential disaster or mass casualty event in northern rural regions of Norway could be improved. The interviews in Chapter 5 and their analysis in Chapter 6 propose several measures that could be put in place. These measures would require investment in equipment, infrastructure and education, but they are essential in order to increase rural resilience.

Nurses working in all aspects of rural northern municipalities should:

- Participate in regular training for disaster and mass casualty events
- Bring about or initiate exercises for the preparation for disaster and mass casualty events
- Participate in regular training with all emergency services for disaster and mass casualty events
- Participate in Municipal Disaster Management Planning and Municipal Health Preparedness Planning.
- Participate in Municipal Disaster Management Teams.
- Be consulted about the need for medical equipment and drug requirements in potential cases of disaster and mass casualty events
- Be knowledgeable about and continuously update knowledge related to injuries from biological, chemical and radiological hazards.

The above points are also transferable to other geographical regions. The reason for this recommendation is that many of the proposals, suggestions and recommendations by the informants of the present study are supported by views, advices, propositions and endorsements by international authors presenting findings within the areas of Disaster Nursing.

7.5 Recommendations for Future Nursing Education in Norway and beyond

The development of the DN - ND framework concept in Chapter 3 demonstrates that nursing education needs to be better aligned with many of the changes that have taken and are taking place in society. Additional support from this statement is seen, for example, from the implementation of the Norwegian coordination reform which changed some of the roles for municipal nurses in Norway as explained in Chapter 2.

Clearly, as society changes there will be a need and demand for other such reforms which will have an impact on the role of nurses. Other current and important society changes are the ageing population, the implementation of technology such as digitalisation of all patients' records and remotely controlled surgery as well as multiculturalism in many smaller mono-cultural countries. All of these changes will have an impact on the role of nurses.

The changing role of nurses must be reflected by education and possibly should be in advance of changes in roles and function. The DN – ND framework points nevertheless to the following recommendations:

(i) BSc in Nursing must in addition to indispensable nursing skills contain fundamentals of important proficiencies such as especially leadership and management, but also digital skills and preparing for and dealing with change

(ii) BSc in Nursing must be the fundament for a series of MSc degrees in Nursing specialisations

(iii) University academics must carry out research in nursing, not only within the philosophical underpinnings, but importantly research for developing and adapting proficiencies and that will become part of the nurses' everyday environment.

Disaster Nursing is a good example which demonstrates why university academics must carry out research in nursing and areas akin to nursing. To enhance the ND route there is a prerequisite to be able to develop new modules and content that must be added to the BSc Nursing provision plus regular opportunities for update and exercising by all nurses.

Research by academic nurses would underpin and disclose such developments, and improvement of this kind would also and importantly increase and update the generic skills of municipal nurses. In a similar manner, academic nurses' research could also support the DN route or as it could also be termed; MSc Disaster Nursing. The research may in the future result in advanced and elaborate modules that could bring about specific Masters pertaining to Disaster Nursing with many differing relevant foci. The discussion and the findings (Chapters 5 and 6) disclosed subject areas such as leadership, management, logistics and equipment requirements to mention some of the possible themes. The outcome from nursing academics research would thus be an enhanced BSc in nursing fulfilling the ND route of the conceptual DN – ND framework in rural northern Norway. In terms of future research to enhance Disaster Nurses skills, it would also be useful to include the scientific community with relevant technical and scientific experts as interviewees or informants. In addition, this research would generate Specialist Masters (MSc) in Disaster Nursing consequently, creating a specialist group of disaster nurses in Norway who could then feature eventually across all the regions of Norway and possibly larger parts of Scandinavia.

The academic nurses' research would then help Norway to finally meet the Stage 3 requirements of the DN-ND Framework; the provision of a permanent comprehensive educational and training strategy and as a consequence, there would be increased quality assurance at the municipal and home care level that nurses can realistically manage to handle health care in relation to disasters and for all the differing aspects of, and within the disaster management cycle.

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List of Appendices

Appendix 1

Bournemouth University

Participant Information Sheet

The title of the research project:
Disaster Nursing or Nursing for Disaster: A case study approach to investigate the future requirements of Disaster Nursing in Norway.

Invitation paragraph.
You are being invited to take part in a research project. Before you decide, it is important for you to understand why the research is being carried out and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

What is the purpose of the project?
This research will investigate the nurses' role, involvement in Disaster Management teams, in the local government disaster plans and how their knowledge and expertise can be used in a disaster, especially in rural communities. The study will also investigate if the curriculum for nurses has a need for Disaster Nursing content. The aim of disaster planning is to be prepared and have resilience to recover and minimise the effect of a disaster. Furthermore, there is a need to identify Disaster Nursing practices to improve the community resilience. The project will be completed by the end of January 2020.

Why have I been chosen?
You are a community health nurse or a leader working in a local government located in rural Norway. The experience and knowledge from your work will be helpful for defining the requirements necessary for Disaster Nursing.

Who can participate?
This study will recruit 30 participants, 2 leaders and 8 nurses from each county and the inclusion criteria are:

- Nurses and leaders working in the three northern counties, Nordland, Troms and Finnmark, in local governments with less than 25 000 inhabitants.
- Nurses must have experiences from working in the local government health care system: home care nurses, nurses working in nursing home, psychiatric nurses or experiences from working in psychological crisis team.
- Leaders must be working in the local government, managing or having responsibility for the health care system.

Do I have to take part?
It is up to you to decide whether or not to take part. If you do decide to take part, you will be given this information sheet to keep and be asked to sign a participant agreement form. You can withdraw during the interview at any time and without giving a reason and we will remove any data collected about you from the study. Once the interview has finished you can still withdraw your data up to the point where the data has been analysed and has become anonymous, so your identity cannot be determined. Your

participation or non-participation will not involve any penalty or adversely affect your employment.

What would take part involve?
There will be individual interviews with open ended questions where you will be able to talk freely about your experience. At the end of the interview the researcher may have some questions to clarify what has been said. The interview will take about one hour and you will decide where and when the interview will take place. The interviews will be audio recorded and transcribed, after which, the transcription the interviews will be returned to you for reading through in order to give your final consent.

What are the advantages and possible disadvantages or risks of taking part?
Whilst there are no immediate benefits from taking part in this study, it could lead to a better understanding of nurse's work in disasters.

What type of information will be sought from me and why is the collection of this information relevant for achieving the research project's objectives?
It is essential to explore your thoughts and experiences to get a wider understanding of what is expected from nurses in a disaster event. The inclusion of both nurses and leaders is to obtain the information from different points of view.

Will I be recorded, and how will the recorded media be used?
The audio recordings of the interview made during this research will be used only for analysis and the transcription of the recording(s) for illustration in conference presentations and lectures. No other use will be made of them without your written permission, and no one outside the project will be allowed access to the original recordings. The audio files will be deleted after transcription.

How will my information be kept?
All the information we collect about you during the course of the research will be kept in accordance with current Data Protection Legislation. You will not be able to be identified in any reports or publications without your specific consent. The results of the research are a part of a PhD and are also likely to be published in journals and at conferences.
All personal data relating to this study will be held for 5 years after the award of the degree.
Regarding hard copy personal information such as participant agreement forms; these will be held in hard copy in a secure location at the University of Tromso (where the Researcher is based) and scanned to pdf format and stored on BU's password protected secure network. All personal data relating to the study will be encrypted and after the study has been completed, will be deleted.
The information collected about you may be used in an anonymous form to support other research projects in the future and access to it in this form will not be restricted. It will not be possible for you to be identified from this data.

If you have any questions about how we manage your information or your rights under the data protection legislation, please contact the BU Data Protection Officer on dpo@bournemouth.ac.uk.

Contact for further information
If you have any questions or would like further information, please contact

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In case of complaints
Any concerns about the study should be directed to Professor Lee Miles.
If your concerns have not been answered you should contact Deputy Dean of research and professional Practice Professor Michael Silk in the Faculty of Management, by email to researchgovernance@bournemouth.ac.uk.

Finally
If you decide to take part, you will be given a copy of the information sheet and a signed participant agreement form to keep.

Thank you for considering taking part in this research project.

Appendix 2

Interview guide – for Nurses

First the researcher will introduce herself and give information about the study. Furthermore, the participant will be informed that he or she can at any time during the interview carry out corrections or withdraw from the interview. The agreement form will then be presented and the participant will have opportunity to ask questions before they sign the consent form (if they have not already signed the form).

The researcher will let the participants talk without interruptions about the theme and follow up with more questions to clarify if needed.

The researcher will then ask the informant to introduce her/him self with name, position, how long they have been working as a nurse and where they have been working.

Nurses work in the community.

1) Can you tell me about your work in the municipal/community, your responsibilities and challenges?

2) How do you think your work has an impact on your municipal/community and the people living there?

3) Do you think the leaders in the local government are familiar with the work nurses do in the community and nurses competence?

Disasters in the community.

Disaster can be defined as a serious disruption and human suffering that have impact on the functioning of a community or society that exceeds its ability to cope using its own resources.

4) What type of disaster do you think are possible in your municipal/community?

5) Can you tell me about your experience from disasters or disaster exercises?
    a. What have you learned from this participation?

6) What do you know about the disaster management plan and health preparedness plan.
    a. Are you familiar with these plans in your local government and at your work?
    b. Have you or your colleagues been involved in disaster management plans?

7) What are your thoughts about using media and technology in a disaster event?

Education and knowledge

If we look at the situation today with an increase in serious events such as human made disasters in terms of terror, war and use of biological weapons as well as natural disasters such as flooding, earthquakes and extreme weather with huge impact on people living in the areas affected. Do nurses acquire enough knowledge through their education to meet these challenges?

8) What kind of knowledge and skills do you think nurses will need to be prepared to meet a disaster event?
    a. Exemplify if you can.

9) Is there a need for more specialised education about nursing in a disaster?

10) What are your thoughts about the kind of knowledge that has to be part of nursing education?

11) How do you think location will affect how you carry out nursing in a disaster?

12) If you look back at your nursing education what did you learn about nursing in disasters?

Nursing in disaster

13) Can you tell me your thoughts about nursing in disasters?

14) Do you think it is different from the work you normally do?

15) What is your role as a nurse in a disaster and in the aftermath of a disaster?
    a. Would it be normal for you as a nurse to lead the emergency health services in a disaster?
    b. If not, why?
    c. How would you lead?

16) Which other emergency professions will you meet if a disaster happens?

17) What are your thoughts about collaboration with other profession in a disaster event?

18) Do you feel prepared for nursing in a disaster?
    a. If not, what is missing?

19) What kind of care do you think the inhabitants in your community will need during and after a disaster?
    a. Has your department resource to meet this need?

20) Do you think Disaster nursing is a sub field or do you think it is nursing as usual but in a different environment?

21) In the relation to the theme of this interview, what are your thoughts about the future?

At the end is there anything you want to add or clarify?
Thank you for taking part in this study.

Appendix 3

Interview guide – for leaders
First the researcher will introduce herself and give information about the study. Furthermore, the participant will be informed that he or she can at any time during the interview carry out corrections or withdraw from the interview. The agreement form will then be presented, and the participant will have opportunity to ask questions before they sign the consent form (if they have not already signed the form).
The researcher will let the participants talk without interruptions about the theme and follow up with more questions to clarify if needed.
The researcher will then ask the informant to introduce her/him self with name, position and length of service as a leader.

Leaders work in the community.

1) Can you tell me about your responsibilities as a leader in the local government and the community?

Disaster in the community.
Disaster can be defined as a serious disruption and human suffering that have impact on the functioning of a community or society that exceeds its ability to cope using its own resources.

2) What type of disaster do you think are possible in your municipal/community?

3) What kind of knowledge do you have about disaster management?
    a. Do you have any education and training in Disaster management?

4) What are your responsibilities in a disaster event?

5) Can you tell me about the local government disaster management plans and what kind of professions have been involved in developing these plans?
    a. The health preparedness plan?

6) If you think about the health resources available in your local government do you have plans for using them in a disaster event?
    a. Do you think they are familiar with these plans?

7) How can nurses knowledge and experiences be used in a disaster management plan and health preparedness plan?

8) What are your thoughts about nurses' work in the community?

9) What are your thoughts about the use of technology, media and social media in a disaster event?

Leading a disaster

10) How would you coordinate the community resources in a disaster?

11) What do you expect from nurses in a disaster event?

12) How can nurses knowledge and experiences be used in a disaster event?
    a. Do you see nurses leading a disaster?

13) In the relation to the theme of this interview, what are your thoughts about the future?

At the end is there anything you want to add or clarify?

Thank you for taking part in this study.

Appendix 4

Norwegian Disasters and large emergencies since World War II

from “Norwaytoday.info” – accessed January 2021

NAME	LOCATION	EVENT	YEAR	Casualties
«Brattegga»-forliset	Nordland, Laukvik, Vågan	Ship sinking	30. mars 1946	14
Kvitbjørn-ulykken	Nordland, Lødingsfjellet	Aircraft accident	28. august 1947	35
Skoghaug-forliset	Northsea, near Holland	Ship sinking	24. desember 1947	24
Dunderlandsdal-ulykken	Nordland, Dunderlandsdalen	Bus accident	5. juli 1948	16
Kings Bay-ulykken 1948	Svalbard, Ny-Ålesund	Mining accident	14. september 1948	15
Bukken Bruse-ulykken	Sør-Trøndelag, Hommelvika ved Trondheim	Aircraft accident	2. oktober 1948	19
Hurum-ulykken	Buskerud, Hurum	Aircraft accident	20. november 1949	34
MS «Bess»' forlis	Nordsjøen vest av Danmark	Ship sinking	13. august 1951	30
Ulykkene i Vestisen	Atlanterhavet, Vestisen ved Grønland	Ship sinking	5. april 1952	78
Kings Bay-ulykken 1953	Svalbard, Ny-Ålesund	Mining accident	19. mars 1953	19
«Laforey»-forliset	Sogn og Fjordane, Ytterøyane ved Florø	Ship sinking	8. februar 1954	21

NAME	LOCATION	EVENT	YEAR	Casualties
«Brenning»-forliset	Sogn og Fjordane, Stadhavet	Ship sinking	1. mars 1956	19
Snøskredulykkene i Lofoten og Vesterålen 1956	Nordland, Lofoten, Vesterålen	Avalanche	7. mars 1956	21
«Pelagia»-forliset	Nordland, sør for Skomvær i Røst	Ship sinking	15. september 1956	32
Stalheim-brannen	Hordaland, Stalheim i Vossnær Gudvangen (SF)	Hotel Fire	juni 1959	25
Holtahei-ulykken	Rogaland, Strand kommune	Aircraft accident	9. august 1961	39
«Sanct Svithun»-forliset	Nord-Trøndelag, Folda	Ship sinking	21. oktober 1962	42
Kings Bay-ulykken 1962	Svalbard, Ny-Ålesund	Mining accident	5. november 1962	21
«Høegh Aronde»-forliset	Atlanterhavet, ved Nordvest-Afrika	Ship sinking	21. mars 1963	15
«Etnefjell»-ulykken	Atlanterhavet, Nord-Atlanteren	Ship sinking	31. oktober 1968	30
«Silja»-forliset	Middelhavet, utenfor Toulon, Frankrike	Ship collision	25. juli 1969	20
Grytøya-ulykken	Troms, Grytøya nær Harstad	Aircraft accident	11. juli 1972	17
Asker-ulykken	Akershus, Asker	Aircraft accident	23. desember 1972	40
MS «Anita»s forlis	Atlanterhavet, utenfor	Ship sinking	22. mars 1973	32

NAME	LOCATION	EVENT	YEAR	Casualties
	kysten av New Jersey			
MS «Norse Variant»s forlis	Atlanterhavet, utenfor kysten av New Jersey	Ship sinking	22. mars 1973	29
«Gaul»-forliset	Finnmark, Nordkapp banken	Ship sinking	8. februar 1974	36
Tretten-ulykken	Oppland, Tretten ve d Lillehammer	Railway Accident	22. februar 1975	27
MS «Berge Istra»s for lis	Stillehavet nær Filip pinene	Ship sinking	30. desember 1975	30
Nordsjø-ulykken 1978	Nordsjøen	Helicopter accident	26. juni 1978	18
Berge Vanga	Atlanterhavet, Sør-Atlanteren	Ship sinking	28. oktober 1979	40
Alexander L. Kielland-ulykken	Nordsjøen, Ekofisk-feltet	Oil platform capsize	27. mars 1980	123
Mehamn-ulykken	Finnmark, Nordkyn	Aircraft accident	11. mars 1982	15
Vassdal-ulykken	Nordland, Vassdalen (Narvik)	Avalanche	5. mars 1986	16
Torghatten-ulykken	Nordland, Torghatten	Aircraft accident	6. mai 1988	36
Måbødal-ulykken	Hordaland, Måbødalen i Eidfjord kommune	Bus accident	15. august 1988	16
Partnair-ulykken	Northsea, Skagerrak utenfor Hirtshals, Danmark	Aircraft accident	8. september 1989	55
«Scandinavian Star»-ulykken	Northsea, Skagerrak	Ship Fire	7. april 1990	136

NAME	LOCATION	EVENT	YEAR	Casualties
Operafjell ulykken	Svalbard, nær Longyearbyen	Aircraft accident	29. august 1996	141
«Leros Strength» s forlis	Nordsjøen, nær Stavanger	Ship sinking	8. februar 1997	20
Barentsburgulykken	Svalbard, Barentsburg	Mining accident	18. september 1997	23
Sleipner-forliset	Hordaland, Sveio, nær Ryvarden fyr	Ship sinking	26. november 1999	16
Åsta-ulykken	Hedmark, Åsta ved Rena	Railway accident	4. januar 2000	19
MS «Rocknes»	Hordaland, Vatlestraumen nær Bergen	Ship sinking	19. januar 2004	18
Terrorangrepet i Norge 2011	Oslo (Regjeringskvartalet) og Buskerud: Utøya i Hole	Terror attack	22. juli 2011	77
Koronavirusutbruddet i 2020	All of Norway	Present pandemi	2020–	200+
Gjerdrum 2020	Gjerdrum, Ask	Land slide	December 2020	7