KNOWLEDGE, SKILLS, COMPETENCIES, AND PSYCHOLOGICAL CAPACITIES OF NURSES FOR DISASTER PREPAREDNESS: A FUTURE DIRECTION

A SYSTEMATIC REVIEW

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† Disaster is a “serious disruption in the community functions that cause a huge loss in many aspects such as human and environment, and this disruption exceeds the ability of that community to cope and using own resources” (International Strategy for Disaster Reduction, 2004, p. 17).

† Disaster preparedness is the adequate knowledge and practical abilities to respond effectively and quickly during and after disasters to combat with the negative consequences of these events (Gladston & Nayak, 2017; Labrague et al., 2017; Slepski, 2005).
Disasters and their destruction effects are increasing worldwide.

The global annual average death rate due to natural disasters during 2011–2015 was 0.3 deaths per 100 000 populations, and the WHO Western Pacific Region reported the highest rate of 0.5 deaths per 100 000 populations (WHO, 2016).

In 2015, there were 346 reported disasters, with an increase of 13.9% compared to 2014 (330), and more than 22,700 people dead (Guha-Sapir, Hoyois & Below, 2016).
Disasters are a significant source of psychological problems. Different reactions may occur such as psychological reactions to traumatic events.

Nurses contribute the largest number of healthcare providers, and they have major roles in disaster response.

They must have sufficient knowledge, skills, and competence to respond to disasters.

BACKGROUND
The aim of this review is to identify the gap in previous research about disaster preparedness of nurses.
• To identify the possible factors influencing low preparedness.

• To generate implications for future studies.

OBJECTIVES
Protocol and registration

This review protocol was prepared using the Preferred Reporting Items for Systematic Review and Meta-Analyses Protocol (PRISMA-P) guidelines (Shamseer et al., 2015).

PROSPERO ID: CRD42018084875

Search method

Five electronic databases were searched for relevant articles which were published from 2013 to October 2017; Pubmed, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Scopus, MedLine, and ScienceDirect.
‡ Keywords and medical subject headings were used in the search strategy: [nurse* AND knowledge AND (skills OR competencies)] AND [disaster AND resilience] AND preparedness.

‡ Articles included were published since 2013-2018, in English language, samples included only nurses, and available in full text. Whereas case studies and review articles were excluded.
Search outcomes

† Articles were considered for inclusion by three stages of identification, screening, and eligibility checking respectively.

† 146 articles identified from searches from five selected electronic databases, and additional four articles from scanning the references of these articles.

† 30 duplicates were sorted and excluded.

† Finally, 20 articles included in evidence synthesis (Table 1, Figure 1).
<table>
<thead>
<tr>
<th>Databases / Keywords</th>
<th>Scopus</th>
<th>CINAHL</th>
<th>Pubmed</th>
<th>ScienceDirect</th>
<th>MEDLINE</th>
<th>Identified from other sources</th>
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<tbody>
<tr>
<td>Nurse* AND knowledge AND skills OR competencies</td>
<td>3490 hits</td>
<td>1515 hits</td>
<td>1231 hits</td>
<td>1037 hits</td>
<td>1346 hits</td>
<td></td>
</tr>
<tr>
<td>(S1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(S1) AND disaster AND Resilience*</td>
<td>25 hit</td>
<td>19 hits</td>
<td>18 hits</td>
<td>24 hits</td>
<td>18 hits</td>
<td></td>
</tr>
<tr>
<td>(S2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>S4</td>
<td></td>
</tr>
<tr>
<td>(S2) AND preparedness*</td>
<td>10 hits</td>
<td>6 hits</td>
<td>7 hits</td>
<td>12 hits</td>
<td>7 hits</td>
<td></td>
</tr>
<tr>
<td>(S3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total S3+ S4 (146 + 4)</td>
<td>35</td>
<td>25</td>
<td>25</td>
<td>36</td>
<td>25</td>
<td>4</td>
</tr>
</tbody>
</table>

**TABLE 1: KEYWORDS SEARCH STRATEGIES**
FIGURE 1: PRISMA SUMMARY OF THE SEARCH PROCESS

Records identified through searching from five databases (n=146)

Additional records identified from other sources (n = 4) (through scanning the references of included articles)

Number of duplicates removed (n = 30)

Abstract / title screened (n = 120)

Records excluded (n = 74)

Full-text articles assessed for eligibility (n = 46)

Full-text articles excluded (n = 26) as they did not meet the inclusion criteria

Studies included in qualitative synthesis (n = 20)

Studies included in quantitative synthesis (meta-analysis) (n = 0)
† Study quality of the 20 studies was assessed using *Mixed Methods Appraisal Tool (MMAT)* (Pluye et al., 2011).

† The quality of studies reviewed is shown in Table 2, & types of study in Table 3.
<table>
<thead>
<tr>
<th>Quality Result</th>
<th># of Studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 %</td>
<td>3</td>
</tr>
<tr>
<td>75 %</td>
<td>12</td>
</tr>
<tr>
<td>50 %</td>
<td>5</td>
</tr>
</tbody>
</table>

**TABLE 2: QUALITY APPRAISAL OF SELECTED ARTICLES**

<table>
<thead>
<tr>
<th>Study Type</th>
<th># of Studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantitative design</td>
<td>15</td>
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<tr>
<td>Qualitative design</td>
<td>4</td>
</tr>
<tr>
<td>Mixed-Methods</td>
<td>1</td>
</tr>
</tbody>
</table>

**TABLE 3: TYPE OF STUDIES**
Data extraction and synthesis

‡ Data extraction were conducted by two researchers.

‡ The results were generated through the thematic analysis (Braun & Clarke, 2014) by study quality and findings of the related studies in order to identify the common themes.
The analysis and synthesis were conducted based on the critical review of 20 articles, with a total of 4,477 nurses involved in the related studies.

Four major themes were identified.
I. Low to moderate level of Knowledge in Disaster Preparedness despite education or training

‡ Nurses perceived their disaster preparedness as insufficient, e.g. lack of general disaster-related knowledge (Alzahrani & Yiannis, 2017; Özteki’n et al., 2016; Park & Kim, 2017; Shapira et al., 2016; Sugino et al., 2014; Usher et al., 2015; VanDevanter et al., 2017).

‡ knowledge in proper use of protective equipment, trauma care (Li et al., 2015; Pesiridis et al., 2015; Seyedin, Dolatabadi, & Rajabifard, 2015), the biological information and management of bioterrorism (Özteki’n et al., 2016; Seyedin, Dolatabadi, & Rajabifard, 2015).
Low to moderate knowledge in preparedness for disaster typhoon relieve (Jiang et al., 2015), hospital disaster policies and role during disasters (Alzahrani & Yiannis, 2017; VanDevanter et al., 2017), and unsure about their roles during disasters (Loke & Fung, 2014; Whetzel et al., 2013).
II. Lack of Competencies for Disaster Preparedness despite previous education or training

‡ Competencies or skills refer to the qualities and abilities that enable nurses to better function in disaster situation (World Health Organization & International Council of Nurses, 2009).

‡ Nurses perceived their competencies in familiarity with disasters was low (M = 90.0; SD = 31.7) (Baack & Alfred, 2013).

‡ Moderate to low levels of competence in nursing to typhoon disaster relief (Jiang et al., 2015), and in adequate skills (M = 3024, SD = 11.577) for disaster preparedness (Özteki’n et al., 2016), in this study nurses had low scores in bioterrorism or biological attacks and leadership, whereas better scores in triage.

‡ Also moderate scores in skill preparedness in the Asia–Pacific region study (Usher et al., 2015), and lack of different skills in dealing with large scale traumas and emergencies (Wenji et al., 2015; Whetze et al., 2013; Li, Turale, Stone & Petrini, 2015; Li et al., 2017).
III. Attitude and Willingness to provide health care during disasters

† Attitude of nurses in disaster time was evaluated in different studies, it found that nurses have moderate attitude, training in disaster relief work regular hospital training, and support from their leaders and family positively influence willingness/attitude to participate in disaster relieve (Park & Kim, 2017).

‡ Perceived behavioral control, subjective norms and knowledge of disaster were influencing nurses’ behavioural intention to provide care during disaster time (Pesiridis, Sourtzi, Galanis, and Kalokairinou, 2015).
Attitudes and willingness to work: Nurses fear that their house will be damaged in the earthquake, fears of losing place of employment due to absence, belief that colleagues will also report to work, self and organizational efficacy perception, concern for family wellbeing, and professional commitment to care for the injured or ill were significantly affecting willingness to work in disaster time ($P < .001$) (Shapira et al., 2016).

Also there is a significant positive relationship between nurses’ attitudes and their practice ($r = 0.450$, $P = .000$) (Jiang et al., 2015). Perceived behavioural control subjective norms, and knowledge were significant effect on intentions to work during disaster ($P < .005$) (Pesiridis, Sourtzi, Galanis, & Kalokairinou, 2015).

RESULTS
IV. The need to Enhancing Psychological Capacity and Attributes

 Emotional and psychological support to the rescue team affect the attitude of nurses to participate in a future disaster relieve (Jiang et al., 2015).

 Post-traumatic psychological care was expressed as a learning need in relation to disaster preparedness (Labrague et al., 2017). Unfortunately, only 20% of participant nurses considered their main role during disasters is to provide psychological care (Alzahrani & Yiannis, 2017).
‡ Nurses could face vast emotions and psychological problems during and after disaster relief (Li, Turale, Stone, & Petrini, 2015).

‡ Nurses revealed that providing psychological support is a main role in disaster relieve, and they could be experienced psychological stress after the relieve (Le et al., 2017).

‡ Nurses have medium perceived knowledge in psychological domain (2.50 ± 0.92) and they rated psychological first aid as a required field for education (Seyedin, Dolatabadi, & Rajabifard, 2015).
‡ Nurses were found to have high resilience levels, and this might have been acquired from different experiences from disaster relief, or post disaster counselling provided by the hospital where the study was conducted (Turner, 2015).

‡ Study revealed the lack of knowledge and skills in mental health care as they are untrained to provide counselling and support to victims or their colleagues, also they were affected by psychological status of the victims during the relieve, years later some experienced PTSD (Wenji, Turale, Stone & Petrini, 2015).

RESULTS
Although majority of the studies used convenience or purposive sampling that could affect generalizability of the results, the findings of this review aggravated evidence about the insufficiency of disaster preparedness of nurses in the aspects of knowledge, attitudes, and competence; and the lacking of experience in delivering disaster care (Jiang et al., 2015; Li, Turale, Stone & Petrini, 2015; Shapira et al., 2016; VanDevanter et al., 2017; Wenji et al., 2014).

Despite the existing training programmes in place, other researchers also identified inadequate preparedness of nurses and other healthcare staff (Al Khalaileh, Bond, & Alasad, 2012; Collander et al., 2008; Fung, Loke & Lai, 2008; Worrall, 2012).
Although effective education and training are believed to be essential in preparing disaster care and sustaining a confident workforce (Baack & Alfred, 2013; Jiang et al., 2015; Labrague et al., 2016; Labrague et al., 2017; Marin & Witt, 2015; Tzeng et al., 2016; Whetzel et al., 2013), the existing evidence has not demonstrated good success.
‡ The situation clearly indicates the need for further and stronger education and training (Al-Ali & Ibaid, 2015; Al Khalaileh et al., 2012).

‡ These may be planned and prepared by multidisciplinary staff of specific expertise, e.g. mental health nurses and psychologists, and that the curriculum and content are designed based on robust guidelines and the competence standards developed by ICN (World Health Organization & International Council of Nurses, 2009).
Psychological capacity and attributes are other essential aspects to build for nurses in regard to their disaster preparedness.

Psychological Preparedness for disasters, in addition to knowledge and skill competencies, will positively support nurses and even the community in facing negative emotions and stress after disasters (Roudini, Khankeh & Witruk, 2017).
Mental health education such as mental health first-aid (MHFA), and psychological debriefing and counseling may help to prepare nurses and other healthcare providers in responding to the mental health needs of victims and or their families suffering from the negative impact of disasters (Langan et al., 2017).

The benefit also applies to nurses themselves as they learn and gain the strength in psychological care which increase their mental health literacy (Jorm, 2000), that they will be able to adapt better to stressful and adverse situations as a result of disasters.

DISCUSSION
‡ From the results of this review, more randomized control trials with the application of better training and education programmes for knowledge and skills, and in particular with a focus on psychological preparedness is needed.

‡ Consideration should also be placed in the curriculum design based on the multidisciplinary approach in terms of continuing education, role development, drills, and building of future plans for disasters preparedness.
‡ The searches of this systematic review included only English language articles; information might also be available from other studies in different languages such as Chinese.
‡ Secondly, searches included only the most recent articles published since 2013.
† Nurses still have low to moderate level of disaster preparedness, and they are in need for better training and education.

† The training for knowledge and skills has focused on theoretical aspect of the disaster management, establishing competencies, and clinical application.

† The clinical skills vary from the basics to advance care, in addition to effective communication, self-confidence, and leadership.
The dynamics of multidisciplinary team in the knowledge development and skills learning must also be included in the education / training programmes.

Since the negative effects of disasters can impact on the psychological status of nurses as a result of their work related pressure and stressful situations, it is also important to enhance the psychological preparedness of nurses by improving their psychological capacity and mental well-being.

CONCLUSION
THANK YOU
REFERENCES


REFERENCES


REFERENCES


