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Measuring Resilience in Health Care Research: A scoping review of questionnaires

Zamzaliza Abdul Mulud ¹, Norfidah Mohamad ¹, Nurman Shah Nuwawi ^{1,2}, Sumiati Sinaga ³

¹ Centre for Nursing Studies, Faculty of Health Sciences,

Universiti Teknologi MARA, Puncak Alam Campus, 42300 Puncak Alam, Selangor, Malaysia

² Orthopedic Department, Sg Buloh Hospital, Jalan Hospital, 47000 Sg Buloh, Selangor, Malaysia

³ Institute of Technology of Health and Science Wiyata Husada, Samarinda, East Kalimantan, Indonesia

zamzaliza@uitm.edu.my, norfidah@uitm.edu.my, amirshah48@yahoo.com, sumiatisinaga@itkeswhs.ac.id

Abstract

This review aimed to assess questionnaires or scales used to measure resilience in health care research and outline the domains included in the questionnaires. We used a five-step framework for developing a scoping review by Arksey and O'Malley in 2005. Studies used in this section were obtained from electronic searches conducted on CINAHL and Medline databases. The initial search yielded 4291 articles; 11 papers fulfilled the inclusion criteria, with four questionnaires used to measure resilience. The domains outlined by all questionnaires were overlapping and inconsistent. The most common resilience domains are competence, acceptance and support.

Keywords: COVID-19, resilience, scoping review, questionnaire

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1.0 Introduction

Numerous discipline-based definitions of resilience have been proposed in the literature. The earliest publication in psychiatry used the term 'invulnerable', referring to resilience among children who experienced adversity (Earvolino-Ramirez, 2007). The word resilience originated from the Latin verb *resilire*, or "to leap back" (Fletcher & Sarkar, 2013). In healthcare research, resilience can be defined as an individual's capacity to sustain or restore generally stable psychological and physical functioning in the face of difficult life situations and hardship (Seiler & Jenewein, 2019).

In 1974, the first study related to resilience was published by Gamezy et al. Gamezy's interest in studying resilience was motivated by his observation of the different outcomes of adversity in patients with schizophrenia. He noticed that when two groups of patients were diagnosed with similar conditions, such as schizophrenia, some patients coped and adapted well in life while the others did not (Garcia-Dia et al., 2013). In 1992, Werner and Smith conducted a study that impacted today's resilience concept. They studied children living in poverty born in 1955 and evaluated the outcomes of this adversity in their later life. They found that although the children grew up in a challenging and tough life, they could adapt and function well as adults. The positive outcomes were reported to have a strong linkage

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with internal and external factors such as personality, advanced motor skills, language skills, and interaction with family and community (Garcia-Dia et al., 2013).

The work environment of healthcare personnel, including nurses, doctors and therapists, is stressful and demanding, especially during the COVID-19 pandemic. Similarly, once diagnosed with an illness, patients and caregivers are often experienced a high level of stress and impaired psychological well-being. Thus, resilience might be the key to explaining how health care workers, patients, and caregivers bounce back and deal with challenges associated with chronic or acute medical conditions and stressful work environments during COVID-19. Since the concept of resilience was introduced in healthcare research, numerous questionnaires have been developed to measure this concept. Thus, this review aims to determine the questionnaire developed and used and health care research and the domains of resilience included in the questionnaire. There are two research questions guided this review:

- a) What are the questionnaires used to measure resilience in healthcare research?
- b) What are the domains of resilience included in the reviewed questionnaires?

1.1 Literature review

Research findings revealed that even when experiencing adverse events such as COVID-19, there were individuals who showed positive responses and adapted well to the circumstances (Schmuck et al., 2022; J. Zhang et al., 2020). Therefore, the question arises as to why some individuals can cope well with a comparable level of adversity while others do not. One possible explanation is that some individuals are more resilient than others. Previous studies reported that resilience predicted various psychological distress, such as anxiety and depression, and those with high resilience reported lower levels of psychological distress (Mosheva et al., 2020; Rivas et al., 2021). Resilience is also associated with positive mental health, such as life satisfaction (Bozdağ & Ergün, 2021) and personal accomplishment (Safiye et al., 2022). Thus, promoting resilience is crucial in the health care environment, coping with illness and adapting to unexpected events such as the COVID-19 pandemic.

The COVID-19 pandemic has revealed pre-existing psychological issues among Malaysia's population. Depression and anxiety were reported to be higher in adolescents (Chen et al., 2020), university students (Nakhostin-Ansari et al., 2020) and the general population (Zhang et al., 2021) during the COVID-19 pandemic than before the pandemic. In addition, healthcare workers and patients are the populations affected tremendously by the COVID-19 pandemic. Nurses, doctors and other healthcare professionals are required to work extra hours in order to manage the influx of patients admitted to the hospitals during the pandemic. Anxiety and depression were also higher during the pandemic among patients with chronic illness (Lau et al., 2021) due to isolation and challenges in managing their condition. Therefore, promoting and strengthening resilience prepare our society for adverse events in the future.

Government and non-government initiatives have focused on improving and strengthening resilience among the population through various programmes, such as *Keluarga Akrab Mencapai Impian* (KAMI). This program aims to enhance resilience among marginalised communities and the underserved B40 population. However, measuring the results and effectiveness of these programmes using valid tools is critical, as resilience is a multifaceted and multifactorial concept (Moya & Goenechea, 2022). Past studies did not adequately describe the characteristics of the resilience measurement scales, but all included a variety of psychometric properties. A recent methodologic review of resilience measurement scales concluded that many lacked conceptual adequacy by focusing on psychometric properties rather than investigating resilience at multiple levels (Johnston et al., 2015). Therefore, this review aimed to determine the questionnaires used to measure resilience in healthcare research.

2.0 Methods

We used a framework for developing a scoping review by Arksey & O'Malley (2005). This framework outlines the five-stage process of scoping review: 1) identify the relevant research questions, 2) identify relevant studies, 3) study selection, 4) chart the data and 6) collate, summarise, and report the results. The whole process of developing this scoping review is further discussed below.

2.1 Search strategy

Studies used in this review were obtained from electronic searches conducted on Medline and CINAHL databases. Keywords used were based on MeSH terms: "resilience" AND "healthcare" "resilience", "patients" OR "clients" AND "resilience" and "patients" OR "clients". Figure 1 shows the PRISMA flow diagram for database search and screening.

2.2 Screening, inclusion and exclusion criteria

The publication period was limited to studies published within the past three years (2020 to 2022). Other limits include papers published in peer-reviewed journals in the English language. We include papers on resilience in either healthcare workers or patients, and studies focusing on resilience among the general population were excluded. Review articles, discussion papers, editorials, opinions, and abstracts

without full text were excluded as well. We also excluded papers that did not report the reliability of the questionnaire. ZAM and NM conducted the screening process of full text, and any disagreement or discrepancy was solved by a discussion with a third reviewer (NSN).

2.3 Data extraction

We extracted the data such as author, country, main study objective, sample, and result from the retrieved articles. A summary of the study characteristics is presented in Table 1. Thematic analysis was conducted to determine the resilience domain in the reviewed questionnaire.

2.4 Appraisal

ZAM and SS conducted a quality appraisal of the papers. The Mixed Methods Appraisal Tool (MMAT) was used to evaluate the quality of the papers included in this review. Since all the studies were cross-sectional designs, the evaluation only used this tool's "Quantitative Descriptive" section. We appraised the papers based on five criteria a) sampling strategy relevant to address the research question, b) sample representative of the target population, c) the measurements appropriate, d) the risk of nonresponse bias low, and finally, e) statistical analysis appropriate to answer the research question. Since this review aimed to determine the questionnaire used to measure resilience in healthcare research, we performed a brief appraisal of the questionnaire's psychometric properties.

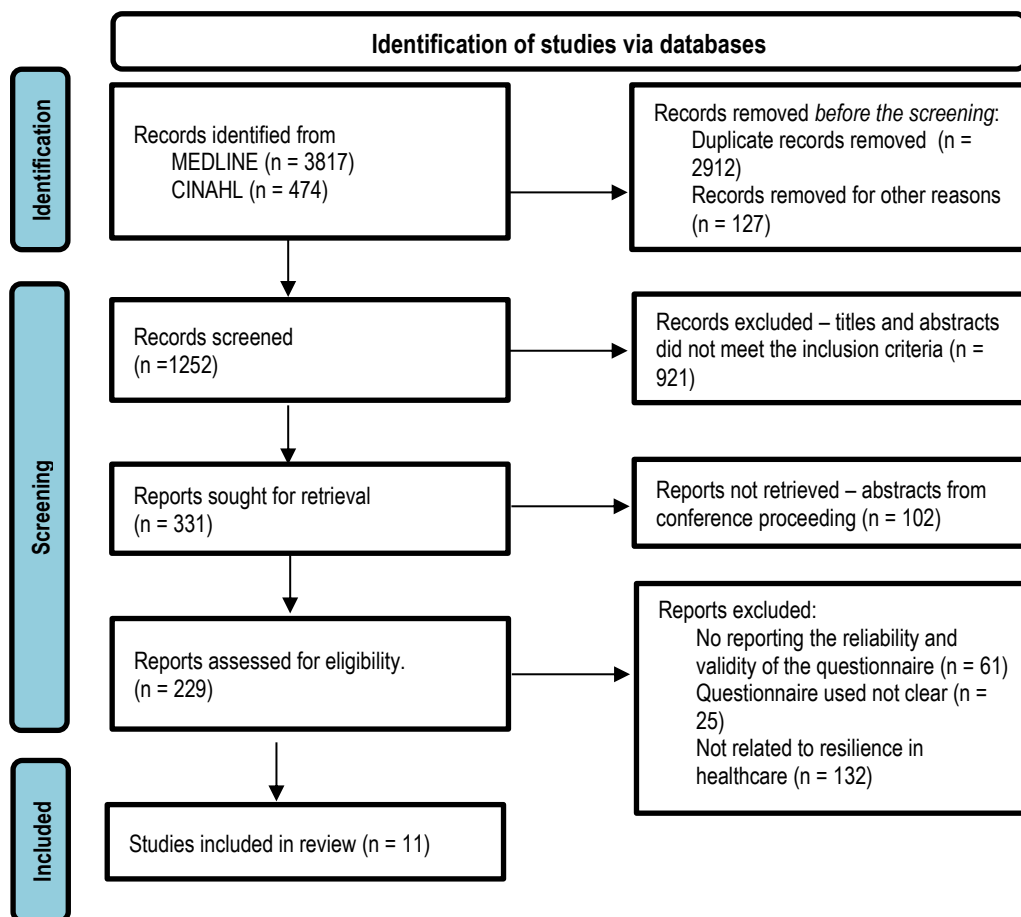


Figure 1: PRISMA flow diagram for study search and screening

3.0 Results

The initial search yielded 4291 papers relevant to the keywords used. However, 11 papers were included in a final review after screening inclusion and exclusion criteria and quality appraisal. All studies were quantitative, with 11 using a cross-sectional design and conducted in nine countries. Nine papers were conducted among health care workers, and two papers among patients with chronic illness and COVID-19. All papers were published between 2020 to 2022. Table 1 presents the study characteristics of papers used in this review.

Table 1: Characteristics of the studies included in the review

| Author / Country | Name of the questionnaire | Item / Chronbach's alpha value | Response format | Main study objective | Sample | Result |
|------------------|---------------------------|--------------------------------|-----------------|----------------------|--------|--------|
|------------------|---------------------------|--------------------------------|-----------------|----------------------|--------|--------|

| | | | | | | | |
|-----|---|----------------------------------|-----------|---|--|---|---|
| 1. | Mosheva et al., 2020 Israel | Connor–Davidson Resilience Scale | 10 / 0.88 | 5-point Likert scale ranging from 0 (not true at all) to 4 (true nearly all the time) | Investigate the association between pandemic-related stress factors (PRSF) and anxiety and to evaluate the potential effect of resilience on anxiety among physicians. | Israeli physicians (n=1106) | Negative correlation between resilience and anxiety |
| 2. | Zhang et al., 2020 China | Connor-Davidson resilience scale | 25 / 0.95 | 5-point Likert-type scale ranging from 0 (never) to 4 (almost always) | Study the relationship between resilience, anxiety and depression among patients with COVID-19 | Patients with COVID-19 symptoms (n=296) | Levels of resilience were lower than in Chinese adults. |
| 3. | Rivas et al., 2021 Spain | Connor–Davidson Resilience Scale | 10 / 0.85 | 5-point Likert-type scale ranging from 0 (totally disagree) to 4 (totally agree). | Assess burnout syndrome as well as resilience in hospital-care nurses during an outbreak of COVID-19. | Registered nurses (n=101) | Emotional fatigue negatively correlated with resilience. |
| 4. | Kalaitzaki & Rovithis, 2021 Greece | The Brief Resilience Scale | 6 / 0.79 | 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). | Determine the role of resilience and coping strategies in the secondary stress of healthcare workers following the COVID-19 | Healthcare workers (n=673) | Resilience correlated with secondary traumatic stress |
| 5. | Bozdağ & Ergün, 2021 Turkey | The Brief Resilience Scale | 6 / 0.82 | 5-point scale 1 (never suitable) to 5 (ranging from completely suitable) | Investigate the psychological resilience of healthcare workers | Healthcare workers (n=214) | Psychological resilience positively correlated with life satisfaction, |
| 6. | Tam et al., 2021 China | Connor-Davidson resilience scale | 9 / 0.93 | 5-point Likert-type scale ranging from 1 (not at all) to 5 (nearly all the time) | Determine factors contributing to psychological health during the COVID-19 pandemic | HIV healthcare providers (n=1029) | Resilience mediated the relationship between COVID-19 and psychological stress. |
| 7. | Yörük & Güler, 2021 Turkey | Resilience Scale for Adults | 33 / 0.86 | 7-point Likert-type scale ranging from 1 to 7 | Determine the factors associated with resilience, burnout and stress | Midwives and nurses (n=377) | Resilience was a protective factor for the risk of depression. |
| 8. | Olashore et al., 2021 Botswana and Nigeria | The Resilience Scale | 14 / 0.94 | 7-point Likert-type scale ranging from 1 to 7 | Investigate the prevalence of anxiety and the effect of resilience on anxiety among healthcare workers from two African countries. | Healthcare workers (n=373) | Resilience predicted levels of anxiety |
| 9. | Lau et al., 2021 China | Connor-Davidson resilience scale | 10 / 0.94 | 5-point Likert-type scale ranging from 0 (not true at all) to 4 (true nearly all of the time) | Investigate the psychological adjustment among a group of community-dwelling individuals with chronic illnesses during COVID-19 | Adults with chronic illness (n=408) | Resilience mediated the relationship between changes in daily lifestyle and mental health. |
| 10. | Safiye et al., 2022 Serbia | The Brief Resilience Scale | 6 / 0.80 | 5-point Likert type scale ranging from 1 (strongly disagree) to 5 (strongly agree) | Determine the relationship between resilience and burnout syndrome among healthcare workers during the COVID-19 pandemic. | Healthcare workers (n=406) | Resilience was a significant negative predictor of emotional exhaustion and positive predictor of personal accomplishment |
| 11. | Schmuck et al., 2022 Germany | The Resilience Scale | 5 / 0.82 | 7-point Likert scale ranging from 1 (I disagree) to 7 (I completely agree) | Identify correlates of individual resilience | Healthcare workers (n=1034) | High levels of resilience in healthcare workers during COVID-19 |

3.1 Questionnaires measured resilience in healthcare research

The review found that the most frequently used questionnaire to measure resilience in healthcare research was the Connor-Davidson Resilience Scale (CD-RISC) (n=5). The CD-RISC (Connor & Davidson, 2003) was used to measure resilience among healthcare workers (Mosheva et al., 2020; Rivas et al., 2021; Tam et al., 2021), patients with chronic illnesses (Lau et al., 2021) and patients with mild symptoms of COVID-19 (Zhang et al., 2020). Studies that used CD-RISC were conducted in China (Lau et al., 2021; Tam et al., 2021; Zhang et al., 2020), Spain (Rivas et al., 2021) and Israel (Mosheva et al., 2020). In these five studies, original 25-item and 10-item versions of CD-RISC were used with reported Chronbach's alpha values ranging from 0.85 (Rivas et al., 2021) to 0.95 (Zhang et al., 2020), indicating that CD-RISC has an acceptable internal consistency. The main findings of these studies showed that resilience was inversely correlated

with anxiety and depression (Mosheva et al., 2020; Rivas et al., 2021) and mediated the relationship between the two study variables (Lau et al., 2021; Tam et al., 2021).

In this review, three studies adapted the Brief Resilience Scale (Smith et al., 2008) to determine the levels of resilience among health care workers during the COVID-19 pandemic (Bozdağ & Ergün, 2021; Kalaitzaki & Rovithis, 2021; Safiye et al., 2022). The studies were conducted in Greece (Kalaitzaki & Rovithis, 2021), Turkey (Bozdağ & Ergün, 2021) and Serbia (Safiye et al., 2022). The 6-item scale was used in all studies, with Chronbach's alpha value ranging from 0.79 (Kalaitzaki & Rovithis, 2021) to 0.82 (Bozdağ & Ergün, 2021). This range is lower than those reported in CD-RISC but still acceptable. Study findings showed that resilience was negatively associated with traumatic stress (Kalaitzaki & Rovithis, 2021) and emotional exhaustion (Safiye et al., 2022) and positively correlated with life satisfaction (Bozdağ & Ergün, 2021) and personal accomplishment (Safiye et al., 2022).

Another questionnaire used to measure resilience found in this review was the Resilience Scale (n=2). The Resilience Scale (Wagnild, 2009) measured resilience among healthcare workers during the COVID-19 pandemic in Botswana, Nigeria (Olashore et al., 2021) and Germany (Schmuck et al., 2022). The 14-item (Olashore et al., 2021) and 5-item (Schmuck et al., 2022) version of this scale was used with Cronbach's alpha value of 0.82 to 0.94, indicating high internal consistency. This scale used a 7-point Likert scale ranging from 1 (Disagree) to 7 (Completely agree). Schmuck et al. (2022) reported a high resilience among healthcare workers during COVID-19 and predicted anxiety levels (Olashore et al., 2021).

The Resilience Scale for Adults (Friborg et al., 2005) was utilised in a study by Yörük & Güler (2021) among Turkish midwives and nurses. This scale consists of 33 items with a 7-point Likert scale ranging from 1 to 7. The reported Chronbach's alpha value was 0.86 (Yörük & Güler, 2021), and resilience was inversely correlated with the risk of depression in this study population.

3.2 Domains of resilience included in questionnaires

The reviewed questionnaires included various resilience domains (Table 2). The Brief Resilience Scale is a questionnaire consisting of a unitary construct of resilience. The domain for other questionnaires such as CD-RISC, the Resilience Scale and the Resilience Scale for Adults ranged from two (Wagnild, 2009) to six (Friborg et al., 2005). However, the primary domain presented in almost all questionnaires was competence. In the CD-RISC and the Resilience Scale, competence is labelled as "personal competence", whereas on the Resilience Scale for Adults as "social competence".

Acceptance is another construct of resilience included in the questionnaires. The CD-RISC and The Resilience Scale labelled acceptance as "positive acceptance of change" and "acceptance of self and life", respectively. Whereas the Resilience Scale for Adults labelled acceptance as "perception of self". Support is another domain in the questionnaire and is labelled as "family cohesion", "social resources", and "secure relationships".

Table 2: Domains of the questionnaire

| Name of the questionnaire | Domains in the questionnaire |
|--|--|
| Connor-Davidson Resilience Scale (CD-RISC) | High standards, tenacity and personal competence, trust in one's instinct, tolerance to negative effects and strengthening effects, positive acceptance of change and secure relationships, control and spiritual influences |
| The Resilience Scale | Personal competence and acceptance of self and life |
| Resilience Scale for Adults | Perception of self, perception of future, social competence, family cohesion, social resources, and structured style. |
| Brief Resilience Scale | The unitary construct of resilience |

4.0 Discussion

There are several theories and models explaining the development of resilience, such as the Resiliency Model (Richardson, 2002) and the Resiliency Model of Family Stress, Adjustment and Adaptation (McCubbin & McCubbin, 1993). These theories and models have been developed to explain the process and illustrate the relationship between certain variables and resilience. The authors emphasised different variables to predict resilience. Despite this, most authors believe resilience is a dynamic process's end product. Thus, measuring resilience with a valid questionnaire is essential.

This scoping review identified questionnaires used to measure resilience in healthcare research, especially during COVID-19. Then, we extracted and explained the domains of resilience in the reviewed questionnaires. Eleven papers that investigated resilience among healthcare workers and patients were analysed. In this scoping review, four questionnaires were used to measure resilience: the CD-RISC, the Brief Resilience Scale, the Resilience Scale and Resilience Scale for Adults. The CD-RISC is a frequently used questionnaire in this review. Connor and Davidson developed the CD-RISC in 2003. The factors measured included personal competence, high standards, tenacity, trust in one's instinct, tolerance to negative effects and strengthening effects, positive acceptance of change and secure relationships, control and spiritual influences (Connor & Davidson, 2003). However, since many concepts are included in one domain, such as "high standards, tenacity and personal competence", it may confuse the researcher.

The Brief Resilience Scale by Smith et al. (2008) was developed to investigate the ability to bounce back or recover from stress. Smith et al. (2008) tested the Brief Resilience Scale on four samples: undergraduate students, cardiac rehabilitation patients, women with fibromyalgia, and a healthy population. In this review, the Brief Resilience Scale was used on health care workers (Bozdağ & Ergün, 2021; Kalaitzaki & Rovithis, 2021; Safiye et al., 2022). The questionnaire consists of the unitary construct of resilience. Since it is comprised of

only six items, this scale is appropriate for rapid use in the clinical setting to collect baseline data before stating any intervention to promote resilience.

On the other hand, the Resilience Scale was originally developed for a sample of older women and later validated on adults between 53 to 95 years of age (Wagnild & Young, 2009). There are two dimensions of resilience measured by this scale: personal competence and acceptance of self and life. In relation to the application of these questionnaires to a specific population, some arguments stated that the original authors constructed questionnaires like CD-RISC, the Resilience Scale and the Resilience Scale for Adults based on cognitive/individual factors of resilience, thus limiting their application to other populations such as youth and adolescent.

With regard to the domains of resilience in the questionnaires, some inconsistencies exist. The most common domains included in the questionnaires are competence, acceptance and support; however, other domains are unrelated. The discrepancies in the constructs and domains found in the reviewed questionnaires hinder the comparison of research findings and make it difficult to operationalise resilience in healthcare research.

5.0 Conclusion and Recommendation

This scoping review discussed four questionnaires used to measure resilience in healthcare research during the COVID-19 pandemic. All questionnaires were reliable and can be used in various populations. The most prominent domains of resilience in the questionnaire are competence, support and acceptance. The literature about resilience in healthcare research and other areas is diverse, so the authors decided to focus on measuring resilience during COVID-19, as resilience is a crucial trait that predicts coping with adversity. To our knowledge, this is the first review investigating the questionnaires used to measure resilience and determine the domains. However, it should be mentioned that the limitation of this review. As part of the literature search was conducted manually, there was a risk that the relevant articles were not identified. Thus, we recommended using an automated reference management system for literature search and management. Then, since this review focuses on papers from the last three years and is mostly related to COVID-19, future reviews should focus on general resilience in healthcare research so that more questionnaires can be found and reviewed.

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Paper Contribution to Related Field of Study

The findings of this scoping review provide new insight into how resilience can be measured in health care research.

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