Development and Psychometric Properties of a Compassionate Care Questionnaire for Nurses

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Abstract

**Background**: Compassionate care is emphasized within professional ethics codes for nursing and is a key indicator of care quality. The purpose of this study was to design and assess the psychometric properties of a compassionate care instrument for nurses.

**Methods**: This methodological study was carried out in two qualitative and quantitative phases from February 2016 to October 2018. The first phase was composed of a qualitative study using a content analysis approach to explain the concept of compassionate care through interviewing nurses, patients and family caregivers. The original draft of the questionnaire was developed using qualitative findings and a subsequent review of literature. In the second phase, the psychometric properties of the questionnaire were assessed for validity and reliability. Data analysis was performed using descriptive and inferential statistics via SPSS v.16 software.

**Results**: According to the results of the qualitative phase and review of literature, 80 items were extracted. In the quantitative phase, face and content validity led to retaining 40 items. In construct validity, 28 items with a factor load above 0.4 were retained. Convergent validity showed a moderate correlation coefficient between the questionnaire and the nurses' caring behaviors tool \((r = 0.67, P = 0.01)\). Reliability of the 28-item questionnaire using the calculation of the Cronbach's alpha coefficient and the intra-class correlation coefficient were reported as 0.91 and 0.94 for the whole questionnaire, respectively.

**Conclusion**: The questionnaire had an appropriate validity and reliability for measuring nurses' compassionate care. Therefore, the instrument can be used to measure and report the quality of nursing care.

**Background**

Compassion is the main focus of health care policy and the essential characteristic of person-centered nursing care [1-3]. It is widely considered the first principle of health care ethics [4], as well as the basis of high-quality care delivered by healthcare professionals [5].

Frampton et al. (2013) define compassion as "a deep sense of connection to the experience of human suffering that requires personal awareness of others' suffering and moral response". From Dewar's perspective, compassionate care is the relief of individuals' suffering [6]. Several studies have reported the positive clinical and health outcomes of compassionate care in both patients and nurses. For example, compassionate care can increase patient satisfaction and increase nursing job satisfaction [7]. On the other hand, lack of compassionate care leads to lower standards of care [8].

Compassionate care has been considered the patient's right [9] and is one part of the professional performance standards that health care providers need to be educated about and healthcare systems should measure and report it [10,11].
Although, it is always emphasized on ethical principles such as compassion in the educational context, the real problems arise when nurses face organizational realities [12]. The providing of compassionate care depends on not only the therapist, but the members of the healthcare team and the organizational context [11].

One of the important barriers to improving the quality of patient care and satisfaction with care is the lack of a compassionate clinical scale with strong psychometric properties [13]. Currently, there is no a standard instrument for measuring compassionate care in the health care system. Compassion is one aspect of the quality of care that should be continuously evaluated [14].

Assessment of compassionate care is essential for evaluating and enhancing clinical performance [11]. Empirical evidence of compassionate care in health care systems is scare, since the empirical perception of the nature of compassion has not been well developed. In addition, most studies have been based on predefined theoretical definitions that lack specificity, clinical applicability, conceptual validity, and are not patient-orientated [10]. Also, studies have not been conducted using appropriate compassionate care tools in nursing.

One of the challenges for the measurement of compassion care in nursing is that its meaning varies depending on people’s perspectives. The concept of compassion is complex and its measurement needs to reflect the concept from the perspective of patients, family members and clinical staff [15].

There are some instruments available to measure compassionate care for physicians [16], and the public, and on compassionate competence [17,18], or non-verbal compassionate communication [19]. In addition, in most available tools, the definition of compassion has been borrowed from the dictionary or a review of literature. Therefore, they do not cover all aspects of compassionate care as delivered by nurses. The present study aimed to design and analyze the psychometric properties of an instrument for measuring nurses’ compassionate care.

**Methods**

This methodological study was conducted from February 2016 to October 2018 in one of the southeastern cities of Iran. In the first phase, dimensions of the concept of compassionate nursing care were developed. In this regard, individual interviews were completed with 20 nursing staff (including 18 nurses and 2 nursing instructors working in different in-patient wards of hospitals affiliated with the university. Clinical specialisms included surgical, emergency, burn, hemodialysis, CCU, and ICU), 8 patients and 6 family caregivers. In addition, two focus group interviews were conducted with one including 6 nurses from internal, emergency, CCU and ICU specialisms, and the other involving 6 nursing instructors.

At the end of the qualitative phase, items for the questionnaire were extracted so that, in accordance with the qualitative study goal, the definition of the concept of compassionate nursing care and its constituent dimensions was determined. Next, using this template, the pool of items based on the domains and sub-
domains of the concept of compassionate nursing care was created (inductive approach). Also, a review of literature and relevant questionnaires (deductive approach) were used. The research team then merged overlapping items and the initial 80 item version of the questionnaire was considered for psychometric analysis. The second phase of the study was the psychometric assessment of the instrument. Face and content validities were performed using qualitative and quantitative methods. Also, structure validity and reliability were performed.

For qualitative face validity, the perspectives of 12 nurses working in different specialisms, as well as the perspectives of 3 nursing tutors and 2 language experts were sought in terms of the difficulty level, ambiguity, and grammar in face-to-face interviews. Their comments resulted in amendments to the questionnaires’ contents, but no items were deleted. After reviewing the items, the quantitative method using the impact scores of items helped evaluate validity of the questionnaire. For this purpose, 10 nurses working in the hospital were asked to comment on the importance of each of the items based on the 5-point Likert scale (5 = very important, 4 = important, 3 = relatively important, 2 = not very important, 1 = It does not matter at all). The impact score of each item was calculated and a score more than 1.5 was considered appropriate [20].

For content validity using a qualitative method, 15 nurses who had significant knowledge and experience in the field of instrument development and nursing ethics participated. They were asked to comment on each item in terms of the grammar, use of appropriate words, the placement of the items and scoring. For content validity, the content validity ratio (CVR) was calculated to determine the necessity of each item. Also, the content validity index (CVI) was used to examine the relevance of each item regarding the concept of compassionate care [21]. The Kappa coefficient for the agreement between evaluators was calculated using the total content validity index (S-CVI) [22]. The initial form for determining the Content Validity Ratio (CVR) was on the basis of the 3-point Likert Scale (necessary, useful but not necessary, not necessary). According to the Lawshe table, items with a score equal to or greater than 0.49 were retained [23].

The Content Validity Index (CVI) was calculated through the Waltz & Bausell (2010) approach. This involved the evaluation of the perspectives of 15 specialists based on the criteria of relevance, simplicity and clarity on a 4-point Likert scale. The cutoff point for the CVI was considered 0.78 and higher [23].

Similarly, the Kappa statistics were calculated for an agreement between evaluators [22]. The mean of the content validity index (S-CVI) was also used to calculate the total content validity index (S-CVI) [24].

Before exploratory factor analysis, item analysis was conducted with a sample size of 40 people. Item analysis was performed to assess the Cronbach's alpha coefficient for initial reliability and to identify items that affected reliability [25, 26].

In this study, exploratory factor analysis was used to assess the construct validity of the questionnaire. To determine the required sample size for factor analysis, 5–10 people per item has been recommended though a higher sample size has also been suggested [27]. Three individuals for each item has been suggested if the factor load for each item is above 0.80 [28]. In the present study more than 10 nurses...
were sampled for each item \(n = 420\). The exploratory factor analysis was performed using the Kaiser-Meyer-Olkin Index (KMO) and the Bartlett's test of sphericity, main component analysis, Scree plot and varimax Rotation with a sample size of 420 nurses.

To determine the number of constructs, initial Eigenvalues and scree plot were used [29]. In the next step, the exploratory factor analysis method was performed using the varimax rotation. The factor load of each item in the factor matrix and the rotated matrix should be at least 0.4 [30]. To assess convergent validity, this questionnaire and the Wolf et al.'s questionnaire (CBI-42) (1998) were given simultaneously to 100 nurses and the correlation between scores was examined.

The internal consistency and stability were used to assess reliability of the questionnaire. Internal consistency was assessed with a sample size of 420 nurses. The Cronbach's alpha of 0.7 to 0.8 indicated a favorable internal consistency [26]. The test-retest method was used to assess consistency of the questionnaire by 50 nurses within a two-week interval. The scores of the two tests were calculated using the calculation of the intra-class correlation coefficient for each of sub domains and the whole questionnaire. Burns and Grow (2014) recommended the stability of the questionnaire to be assessed over a period of 2 weeks in a month. \(^{31}\) The index rating above 0.8 was a sign of the instrument's stability [32]. The ease of use of the questionnaire, as well as the effect of ceiling and floor were studied.

Inclusion criteria for nurses were having at least a bachelor's degree, willingness to participate in this research, having manageable workload, appropriate physical and mental status. Data analysis was performed using the SPSS software v.16.

**Results**

In the qualitative stage, individual and focus group interviews were conducted to explain the concept of compassionate nursing care. Dimensions of the concept included effective interaction, professionalism, and continuous comprehensive care. Definition of the concept has also been identified as follows: Compassionate care is a professional-quality care that takes place through clinical excellence, adherence to ethical values, and openness to needs. Effective interaction through the use of emotional support, building trust and communication skills, along with continuous comprehensive care for the coordination and integrity of the patient’s existential dimensions occurs at the moment [33].

Upon completion of the phase, the nurses' compassionate care measurement questionnaire was prepared according to the definition of the concept of compassionate nursing care and its constituent dimensions. This consisted of 98 items. Within the review of available literature, 130 possible items were identified based on the studies examined. The research team merged a number of overlapping items, so the final number was reduced to 80.

Qualitative face validity led to some modifications and revisions of the items. For quantitative face validity, the impact item score was calculated and all items except 5 items which achieved a score more than 1.5. Therefore, the number of items was further reduced from 80 to 75 items.
In qualitative content validity, expert opinions led to merging overlapping items. Next, a questionnaire with 48 items was prepared for quantitative content validity. The CVR and CVI were calculated. For CVR, 40 items achieved scores more than 0.49 and were retained. Given the cutoff point of 0.78 for the content validity index, this index was more than the minimal level in all items and therefore, no items were deleted. Also, the Kappa coefficient score for 40 items was excellent. Mean score of the content validity index (SCVI / Ave) was 0.91, which was considered to be excellent.

Before factor analysis, item analysis was performed with a sample size of 40 nurses. Reliability of the questionnaire was reported as 0.94 based on the calculation of the Cronbach's alpha coefficient. The results of item analysis to assess the correlation coefficient between the items and the total score led to the elimination of 2 items. In other cases, each item had an association with at least one other item reported as 0.2–0.3, and no item was deleted.

To analyze construct validity of the questionnaire, for analyzing the data in the first stage of factor analysis, the sampling adequacy index by Kaiser-Meyer-Olkin Index test was calculated and reported as 0.928. The results of Bartlett’s test of sphericity was significant at P < 0.001.

To determine the number of constructs of the questionnaire, the Initial Eigenvalues and the scree plot were used. An initial analysis with a special value more than one was performed, and along with 8 factors accounted for 57.278% of the observed variance. The scree plot showed that the major variance was assigned to the first factor, and it was flat for other 4 factors (Fig. 1). Therefore, through limiting the number of factors to 4 factors, a factor analysis was performed and items were considered. The factor analysis led to 4 factors accounting for 48.05% of the variance.

In the next step, the exploratory factor analysis method was performed using a varimax rotation. In this research, factor load of 0.4 was considered the minimum acceptable degree of correlation between each item and extracted factors. At this point, those items that had a high correlation with each other were included within a category. At this stage, the research team decided to delete five items that did not reach the minimum load factor of 0.4 or had repetitive concepts. The final questionnaire had 28 items with four factors of professional performance (9 items), continuous follow up (6 items), Surrogacy (7 items), and empathic communication (6 items) (Table 1).
| Domain                        | Item                                                                 | Extracted factors |
|-------------------------------|----------------------------------------------------------------------|-------------------|
|                               |                                                                      | 1    | 2    | 3    | 4    |
| Professional performance      | 16. I try not to hurt the patient while taking care of him/her.       | 0.73  |     |     |      |
|                               | 14. I respect the patient and his/her beliefs in nursing care.        | 0.67  |     |     |      |
|                               | 12. When I take any clinical intervention, I take into consideration  | 0.59  |     |     |      |
|                               | the privacy of the patient                                           |       |     |     |      |
|                               | 15. I take care of my patient regardless of the economic, social,    | 0.58  |     |     |      |
|                               | religious, and cultural conditions                                   |       |     |     |      |
|                               | 9. Based on scientific principles, I take care of my patient.        | 0.57  |     |     |      |
|                               | 30. I take necessary measures to maintain patient safety.             | 0.53  |     |     |      |
|                               | 5. By taking expert care, I attract my patient's confidence          | 0.51  |     |     |      |
|                               | 13. I'm trying to keep my patient information safe.                  | 0.50  |     |     |      |
|                               | 23. My inner strength obliges me to do my care well.                 | 0.43  |     |     |      |
| Continuous follow up          | 37. During the work shift, according to the conditions of the patient| 0.66  |     |     |      |
|                               | I monitor him/her with a more frequency at the bedside.             |       |     |     |      |
|                               | 36. I follow my patient care affairs.                                | 0.65  |     |     |      |
|                               | 38. I report my patient complaints to related authorities           | 0.58  |     |     |      |
|                               | 35. I train the patient and his family members about care and       | 0.57  |     |     |      |
|                               | treatment                                                          |       |     |     |      |
|                               | 33. I encourage family members to emotionally support their patients | 0.55  |     |     |      |
|                               | 32. In case of a financial problem, I refer the patient to a social  | 0.51  |     |     |      |
|                               | worker or related social support institutions.                      |       |     |     |      |
| Surrogacy                     | 27. If I need a patient, I will consider a time in addition to the   | 0.64  |     |     |      |
|                               | routine visit times for family members                              |       |     |     |      |
|                               | 10. Upon observing the patient's condition, I can diagnose her/his   | 0.63  |     |     |      |
|                               | problems and take necessary measures                               |       |     |     |      |
11. I conduct nursing care planning (nursing diagnosis and prioritization of problems) on a regular basis. 0.56

18. My patient is entitled to accept or refuse treatment and care interventions 0.53

29. I give the patient bible, the supplication, and facilities of worship or prayer 0.49

26. I monitor the quality of my daily care. 0.47

17. I try to care for the patient’s independence 0.42

| Empathic communication | 3. To identify and solve my patients’ problems, I establish a sincere relationship with him/her in the cultural and religious framework 0.69 |
|------------------------|-----------------------------------------------------------------------------------------------------------------|
|                        | 1. With open-mindness, I provide care to the patient 0.62                                                        |
|                        | 2. When I take care of a patient, I put myself or my loved ones to the patient’s position 0.58                   |
|                        | 4. With honesty in my behavior and speech, I try to win the confidence of my patient 0.50                       |
|                        | 7. use verbal communication skills (simple and clear speaking and feedback) during care 0.48                   |
|                        | 8. In the cultural and religious context, I use non-verbal communication methods (eye contact, touching, and face-to-face). 0.48 |

To examine convergent validity, the present questionnaire and the Wolf et al.’s (1998) questionnaire for measuring caring behaviors were simultaneously given to 100 nurses. The correlation between the scores was examined. The correlation between the scores of these two questionnaires was moderate (p < 0.001 and r = 0.68)

For reliability, internal consistency and stability methods were used. For internal consistency, the Cronbach alpha coefficients of the whole questionnaire and each of its domains were calculated (Table 2).
Table 2
Cronbach's alpha of subscales and the entire nurses' compassionate care questionnaire

| Factors | Subscale                | Items | Cronbach's alpha |
|---------|-------------------------|-------|------------------|
| 1       | professional performance | 9     | 0.83             |
| 2       | Continuous follow up    | 6     | 0.76             |
| 3       | Surrogacy               | 7     | 0.73             |
| 4       | Empathic communication  | 6     | 0.7              |
| Entire  | Questionnaire           | 28    | 0.89             |

In addition to the Cronbach's alpha coefficient calculation method, the split half technique was used to assess internal consistency. In this method, the correlation coefficient between the first and second half items of the questionnaire was calculated, and was reported as 0.82, indicating a desirable reliability of the questionnaire (Table 3). To verify stability, a test-retest method was used. The scores of the two tests were calculated using the calculation of the intra-class correlation coefficient for each of the domains and the whole questionnaire (Table 4).

Table 3
Correlation coefficient of even and odd questions

| Questions | Odd Questions | Even Questions | P-value |
|-----------|---------------|----------------|---------|
| Odd       |               | r = 0.82       | 0.001   |
| Even      | r = 0.82      | 1              | 0.001   |

Table 4
Intra-cluster correlation between scores of subscales and total questionnaire of two tests

| Factors | Subscale                | ICC   | Confidence level of ICC | P-value |
|---------|-------------------------|-------|-------------------------|---------|
| 1       | Professional performance | 0.91  | 0.84–84.95              | P < 0.001 |
| 2       | Continuous follow up    | 0.85  | 0.74–0.91              | P < 0.001 |
| 3       | Surrogacy               | 0.86  | 0.72–0.92              | P < 0.001 |
| 4       | Empathic communication  | 0.88  | 0.78–0.94              | P < 0.001 |
| Entire  | Questionnaire           | 0.94  | 0.89–0.96              | P < 0.001 |

To assess the ease of the questionnaire use, the mean time for completing the questionnaire and the percentage of individuals who did not respond to each item were calculated. The mean time of
completing the questionnaire was reported as 4 minutes with a range of 3–5 minutes. Also, for all items, the rate of non-response should be 0–5%, which was the same with our questionnaire.

The effect of ceiling and floor was that more than 15% of respondents obtained the highest or lowest achievable scores, respectively. In general, the presence of a ceiling or floor effect indicated that the minimum and maximum severity of the phenomenon were not included in the questionnaire, and showed inadequacy of content validity. The results of the study on the effect of ceiling and floor on the sample size of construct validity (n = 420) showed that the minimum and maximum score in none of the subscales and the whole instrument did not reach 15%. So, the questionnaire had no ceiling and floor effect.

In this study, all items were scored on a positive 5-point Likert scale as follows: "always" (score 5), "often" (score 4), "sometimes" (score 3), "rarely" (score 2), and "never" (score 1) (Additional file 1).

**Discussion**

In this study, the instrument of nurses' compassionate care measurement was designed and its psychometric properties were evaluated. In the first stage, individual and focus group interviews were conducted to explain the concept of compassionate nursing care with nurses, nurse instructors, patients and family caregivers. Qualitative findings were presented in three themes of effective interaction, professionalism and continuous comprehensive care. At the end of the qualitative phase, items were extracted based on the operational definitions and a review of literature. Next, the questionnaire was assessed for psychometric properties.

One of the important steps of questionnaire’s design is the process item generation. In the present study, item generation was made using a combination of inductive and deductive approaches. While in some available instruments, the production of items has been solely generated through a review of literature and based on dictionary definitions (deductive approach) [19, 35, 36]. Also, due to the influence of social and cultural factors around the concept, there is a need to incorporate a deep understanding of related experiences of nurses, patients and family caregivers, assessment of which was performed in this study.

Compared to the present study, the Schwartz center compassionate care scale [16] and the Fogarty Compassion Scale (1999) were designed for physicians. It should be noted that physicians and nurses have a different understanding of the needs of patients due to their different professional roles. Also, the nature of nursing care is different and over a more sustained timeframe than medicine.

Some definitions of compassion that are based on dictionary classifications or literature reviews include aspects of empathy or sympathy [10], while compassionate care is conceptually broader than these concepts. In compassionate care is emphasized to interventions for relieving suffering. In some instruments, the word "compassion" itself is used in the scale instead of the use of descriptive variable for compassion [16, 35, 36].
In the study by Lee and Simon (2017), the concept of compassion competence was developed through analyzing the hybrid concept and indicated specific nursing behaviors for measuring the effects of compassion. In this study, only nurses in special wards were interviewed [37], but in the present study, experiences of nurses, patients and family caregivers in specialized units (CCU, ICU, hemodialysis, emergency and burn), surgical and internal medicine were used to explain the concept. Therefore, the present study contained richer information about the concept of compassionate care.

Compared to the present study, in most previous studies, face and content validity was assessed using a qualitative method. In the study by Fogarty (1999) [35], face and content validity was not carried out. The calculation of the item impact score, deletion of inappropriate items and determination of the importance of each item were carried out [20]. Also, calculating the content validity ratio in the present study helped identify those items that were necessary for measuring the concept [21]. Calculating the content validity index helped with identifying related concepts based on the opinions of experts [24]. The Kappa score of the questionnaire was excellent, indicating an agreement between evaluators on the relevance of items.

In the present study, before making construct validity, item analysis was performed. The results of the exploratory factor analysis indicated the adequacy of the sample size for performing construct validity assessment. Varimax rotation led to assignment of 28 items to 4 factors as professional performance (9 items), continuous follow up (6 items), surrogacy (7 items) and empathic communication (6 items). For convergent validity, the questionnaire of Wolf et al.’s (1998) was used, that showed a moderate correlation. For convergent validity, the questionnaire of Wolf et al. was used, that showed a moderate correlation. For convergent validity, the questionnaire of Wolf et al. was used, that showed a moderate correlation. For convergent validity, the questionnaire of Wolf et al. was used, that showed a moderate correlation. For convergent validity, the questionnaire of Wolf et al. was used, that showed a moderate correlation.
to examine reliability. The linear correlation between the first and second half of questionnaire items indicated appropriate reliability of the questionnaire.

In most existing tools, stability has not been reported [18, 19, 35, 36]. The high stability of this questionnaire showed that the individual score of the test would remain constant over time, so this could not be compared with other questionnaires.

In this study, the effect of ceiling and floor on the sample size of 420 nurses was studied. One of the factors influencing the reliability of a tool was the effect of ceiling and floor. If there was no such an effect, individuals with the highest and lowest scores were not intelligible and could not be differentiated, and reliability decreased. No information on the effect of ceiling and floor has been reported in any of available tools.

In the present study, a broad spectrum of participants was considered through selecting a sample of nurses, nurse educators, patients and family caregivers with a maximum variability and a comprehensive psychometric assessment.

**Limitations**

The psychometric properties of the questionnaire were conducted in only one city. Therefore, it is recommended that future studies are carried out in other cities and contexts.

**Conclusion**

A questionnaire was designed in this study to measure nurses' compassionate care. The results of the study showed that the validity and reliability of the questionnaire was supported. The use of the questionnaire was also easy and only took around 4 minutes. Therefore, this is an appropriate questionnaire to measure nurses' compassionate care. Measuring compassion helps recognize the compassionate performance of clinicians, instructors, and policymakers to adopt a more effective strategy to promote compassionate care as an aspect of holistic care.

**Abbreviations**

- **CVR**: content validity ratio
- **CVI**: Content Validity Index
- **S-CVI**: Scale-level content validity index
- **S-CVI /Ave**: Scale-level content validity index/ Average
- **KMO**: Kaiser-Meyer-Olkin Index
CBI-42: Caring Behaviors Inventory - 42 items

Declarations

Ethics approval and consent to participate

This study was conducted in accordance with the World Medical Association's Declaration of Helsinki. The present study was derived from a PhD thesis with project number 95-01-08-13440 and approved by the Research Ethics Committee of Shiraz University of Medical Sciences, Shiraz, Iran (Code: IR.SUMS.REC. 1396.S197). The study materials (interview questions and informed consent form) were approved by the ethics committee of the university. The participants were informed about the objectives of the study, the voluntary basis of their participation. We obtained written informed consent from all participants. The participants were assured about the confidentiality and anonymity of their information.

Consent to publish

Not applicable.

Availability of data and materials

The interview data will not be shared since the participants are guaranteed full anonymity.

Competing interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Authors' Contributions

BT contributed the data collection and prepared the first draft of the manuscript. MR, CT and MF, critically revised and checked closely the proposal, the analysis and interpretation of the data and design the article. MG has reviewed the article critically All authors read and approved the final manuscript.

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Figures
Figure 1

Scree plot to determine the number of factors in the questionnaire

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