The Development of the Caregiving Willingness to Pandemic Patients Scale

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Abstract

AIM: The aim of this study is to develop a scale for evaluating nurses’ willingness to provide care to patients during the pandemic process.

METHOD: This research is a methodological research such as scale development, validity and reliability research. The research was conducted between September and October 2020. Expert opinions were obtained from 20 people, including specialist nurses, lecturers, and faculty members, during the development process of the scale. Construct validity–exploratory factor analysis and construct validity–confirmatory factor analysis were used in statistical analysis. Item–total score correlation analyses and Cronbach’s alpha values were used to assess internal consistency.

RESULTS: A draft of 22 items in total and 4 of them explaining 50% of the total variance of exploratory factor analysis was obtained. Compliance obtained with DFA is achieved. Also, as $\chi^2 = 775.675$, degrees of freedom = 203, CMIN/degrees of freedom (2/degrees of freedom) = 3.82, $P = .000$, goodness–of–fit index = .87, adjusted goodness–of–fit index = .85, comparative fit index = .92, root mean square error of approximation = .073, state regression loads were determined between .41 and .70. In this study, item–total correlation values were .30-.61 and Cronbach’s alpha value was .86.

CONCLUSION: It can be said that all items in the scale provide item validity, and the internal consistency coefficients of the overall scale and its sub-dimensions are good and sufficient.

Keywords: Caregiving, nurse, scale development, willingness

Introduction

Epidemic is a disease that is frequently seen as a novel case in a certain human population over a particular time; however, it has more impact than expected compared with previous experiences. Epidemic is considered a global threat on the World Health Organization (WHO) agenda. The WHO decides whether an outbreak is a pandemic or not, and three conditions have been established for this. According to the WHO, the first condition is the emergence of an epidemic that has been encountered before, the second is that the disease is transmitted to humans and causes a dangerous disease, and the third is that the disease spreads easily and continuously (Aslan, 2020). Throughout history, the diseases that affect people worldwide are smallpox, plague, syphilis, dysentery, cholera, tuberculosis, typhoid, Spanish flu, Asian flu, human immunodeficiency virus/acquired immunodeficiency syndrome, Ebola, severe acute respiratory syndrome (SARS)/Middle East respiratory syndrome, bird flu, mad cow disease, and swine flu; outbreaks are coming (Menekşe, 2020a, 2020b, Erdemir et al., 2011; Uğuz, 2012). As a society, when we come to the 21st century, we see that some of these outbreaks occur globally. Since it appeared in 2019, a virus called coronavirus 2019 (COVID-19) was first encountered in December. By December 2020, more than 1.5 million individuals have died due to this disease worldwide, and more than 67 million were infected (https://news.google.com/). Today, the virus continues to be transmitted through droplets and contact (Aslan, 2020). Given the fast and easy spread of the COVID-19, nurses are known to be at the frontline of the pandemic. In this case, it is seen that nurses frequently are the group with the highest risk of being caught against the factors causing pandemics. Working in health institutions, physicians, nurses, and all other healthcare professionals are affected by the stress of epidemics at the highest level, and they have been trying to cope with the psychological consequences for a long time (Tuncay et al., 2020). Occupational Safety and Health Administration (OSHA) considers healthcare workers as a very high-risk group in terms of the risk of COVID-19 infection (OSHA, 2020). In this case, nurses, being in the high-risk group, experience anxiety at the highest level, considering the possibility of becoming sick or die of the disease, as they see the increase in the number of cases and deaths worldwide. In this period, it is known that there are several healthcare workers, including nurses, who have lost their lives and continue to die due to COVID-19 (Turkish Medical Association, 2020). While the transmission rate of all respiratory disease outbreaks, such as COVID-19, is high, nurses working in certain hospital units are at a higher risk of becoming infected. In addition to emergency services, intensive care units, and infectious diseases services, nurses in primary care are also considered in the high-risk group (Tuncay et al., 2020).
are studies showing the connection between the psychological effect of the epidemic and the occupation of the employee. In studies examining the psychosocial effects of SARS on hospital staff, it has been determined that the most affected occupational group is nurses (Marjanovic et al., 2007).

For nurses, factors such as being infected from the hospital environment with external contamination or being in the same environment with people diagnosed with COVID-19 (Kaya, 2020) as well as the fact that health institutions have a high concrete caseload and the number of employees are generally observed in pandemics and increase psychological strain (Porten et al., 2006). In several studies, it has been stated that being a health worker in an epidemic creates a high level of biopsychosocial stress, even if not traumatic (Chen et al., 2021; Koh et al., 2005; Nickell et al., 2004; Suwantarat & Apisarnthanarak, 2015).

Considering that working during an epidemic will cause non-compliance for nurses, exposure to trauma, fatigue, frustration, anger, and depression can lead to post-traumatic stress disorder (Tominaga et al., 2019). However, burnout symptoms like these may not be observed in everyone who experiences a pandemic. On the contrary, it may be possible to observe advances in nursing under adverse conditions. Studies conducted with healthcare professionals also stated that situations, such as resilience, coping mechanisms, planned work, religious feelings, and the presence of emotional support, show positive results as they will lead to post-traumatic development (Ogińska-Bulik, 2014; Ogińska-Bulik & Zadworna-Cieślak, 2018). Moreover, hospital administrations have critical roles in pandemic action planning. With these roles, new teams established in times of epidemics need to get to know each other, strengthen their supportive interactions, and be psychosocially supported. All these are believed to affect nurses’ willingness to provide care to patients. It is an inevitable fact that the pandemic process is not the first, nor is it an end. However, while the problem is still ongoing, there is no measurement tool in the literature to evaluate the nurses’ willingness to provide care to patients in both experienced and future pandemic processes. For this reason, this research was conducted to develop a scale that could evaluate the nurses’ willingness to provide care to patients in the pandemic process.

Research Questions
1. What is the validity and reliability level of the developed scale?
2. Can the developed scale be used to determine the level of caregiver willingness of health care workers during the pandemic period?

Method

Study Design
This research is the methodological research type.

Sample
Convenience sampling method was used in this study, which was conducted between September and October 2020. In this context, a 30-item draft scale prepared online was sent in state, university and private hospitals as well as for nurses working actively in clinics, intensive care units, operating rooms, family health/community health centres, home health units and radiation units. In the literature, it is recommended to calculate the sample size by taking 5–10 times the number of items in the scale (Bryman & Cramer, 2001). In this direction, considering the number of items in the draft scale, the target sample was determined as 300, and 533 nurses were reached via convenience sampling method. In the online environment, the scale was sent to nurses who were working in private or state–affiliated health institutions and actively cared for patients infected by COVID-19 in at least the last 30 days. The nurses who responded completely to the questions of the scale composed the study sample.

Data Collection Tools

Socio-Demographic Characteristics Form
This form consists of questions including demographic characteristics, such as age and gender, education status of the nurses, the people they live with, the unit they work in, and the duration in the profession.

The Development Process of the Caregiving Willingness to Pandemic Patients Scale
For the research, the item pool of the scale was developed by conducting a comprehensive literature review on the subject. The items in the scale are based on the expressions “strongly agree (5),” “agree (4),” “undecided (3),” “disagree (2),” and “strongly disagree (1)” according to the 5-point Likert rating system, which was developed to be scored. Then, experts in the field were consulted to evaluate how well the items in the scale met the desired property. In the expert group whose opinions were received on the item pool consisting of 30 items in total, there were 13 nurse lecturers with a doctorate in nursing, 5 lecturers with a master’s degree, and 2 clinical nurses. While some items were edited in line with the opinions of the experts, 4 items were completely removed and a draft scale with a total of 26 questions was created. For the pilot application, the draft scale was applied to 50 nurses and Cronbach’s alpha and item-total correlations were evaluated. The Cronbach’s alpha value was .88 after the pilot application. A total of 50 nurses included in pilot application were included in the total sample of the research. No change was made in the draft scale, whose item-total correlations were found to be sufficient, and the data collection process was continued by including the pilot application data in the research.

Statistical Analysis
The data were evaluated using IBM Statistical Package for the Social Sciences (SPSS) Statistics for Windows, Version 22.0 (IBM Corp., Armonk, NY, USA) and IBM SPSS Amos 21 package program. For the validity of the scale, content and construct validities were examined. For the construct validity, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were used. For the internal consistency of the scale, Cronbach’s alpha reliability coefficient, analysis of variance, Tukey’s test for non-additivity, Hotelling’s T-squared, and intraclass correlation coefficient analyses were performed. The status of measuring
the same feature of the items was examined by item-total score correlation analysis.

**Ethical Considerations**

Permission was obtained from the Ethics Committee of the KTO Karatay University Faculty of Medicine Drug and Non-Medical Device Researches (decision number: 2020/012). Participants were informed about the research and were asked whether they agree to participate in the research before completing the scale in the online environment. After the information, consent was obtained from the participants to participate in the research by the investigators.

**Results**

The mean age of nurses participating in the study was 33.37 ± 8.226, of which, 88% (n = 469) were female and 12% (n = 64) were male. Of the nurses, 65% (n = 347), 23.1% (n = 123), 4.7% (n = 25), 3.6% (n = 19), and 3.6% (n = 19) worked in clinics, intensive care units, home care/radiation, operating rooms, and family health/community health centers, respectively. Furthermore, 75.4% (n = 402) of the nurses were university graduates and had an average of 12.01 ± 8.320 years of working time in the profession. Lastly, 22.1% (n = 118) of the nurses themselves and families of 53.3% (n = 284) had a chronic disease.

**Results Regarding the Validity of the Scale**

**Expert Opinion and Content Validity**

To determine the content validity of the created items, the scale was presented to 13 nurse lecturers with a doctorate in nursing, 5 lecturers with a master’s degree, and 2 specialist nurses working in the clinic who have competence in the subject. Experts were asked to evaluate each item by scoring between 1 and 4 (1 = item not suitable, 2 = item should be seriously reviewed, 3 = item should be reviewed, 4 = item suitable).

Scale items were reviewed in line with the expert recommendations received, and the scale was finalized. Necessary corrections were made for items that were not understandable in line with expert opinions, and four items were removed from the scale. The revised scale items were re-sent to the experts, and the content validity index (CVI) was calculated in line with expert opinions. The final draft scale version consisted of 26 items. Expert opinions were evaluated according to Davis’ method. A value of .80 is accepted as the minimum criterion in the Davis methods. Item content validity index (I-CVI) was calculated using the formula of number of experts/total number of experts scoring 3 and 4 for each item, and the calculated ratios were added and divided by the total number of items. Item CVI calculated by taking the opinions of a total of 20 experts was found to be .93 with a range of .80–1.00 (Table 1).

**Construct Validity—Exploratory Factor Analysis**

First, EFA was performed to examine the factor structure of the scale. In the EFA, Kaiser–Meyer–Olkin (KMO) and Bartlett’s tests were used to test the suitability of the collected data for factor analysis. The value of KMO was found to be .88, and Bartlett’s test \( \chi^2 \) values were found to be 3435 and 250 (\( P = .000 \)); anti-image \( r \) values were found between .80 and .93. A high KMO and a significant Bartlett’s test show that the data are suitable for factor analysis. Findings obtained from the EFA are presented in Table 1. As a result of EFA using principal component analysis and varimax rotation technique, it was seen that the 26-item scale was gathered under 6 factors that explained 54% of the total variance with an eigenvalue > 1. However, it was determined that the factor loads of some items remained below .40 and some items were overlapped. For this reason, EFA was repeated by removing the items with low factor loading (15, 18, 21, and 25). As a result of EFA, a structure consisting of 22 items and 4 factors was obtained, which explains 50% of the total variance. In line with the data obtained from the eigenvalue, variance percentages, eigenvalue plot of the factors (Scree plot; Figure 1), and the EFA, it was decided that the scale should have four factors.

Table 1. Cumulative and Individual Item Content Validity Indices

| Item | Individual Item Content Validity Index | Cumulative Content Validity Index |
|------|----------------------------------------|----------------------------------|
| Item 1 | 1.00 |                                   |
| Item 2 | .95 |                                   |
| Item 3 | 1.00 |                                   |
| Item 4 | .95 |                                   |
| Item 5 | .95 |                                   |
| Item 6 | 1.00 |                                   |
| Item 7 | .85 |                                   |
| Item 8 | .85 |                                   |
| Item 9 | .80 |                                   |
| Item 10 | .90 |                                   |
| Item 11 | .95 |                                   |
| Item 12 | .95 |                                   |
| Item 13 | .95 |                                   |
| Item 14 | .90 |                                   |
| Item 15 | 1.00 |                                   |
| Item 16 | .80 |                                   |
| Item 17 | .95 |                                   |
| Item 18 | .80 |                                   |
| Item 19 | .90 |                                   |
| Item 20 | .95 |                                   |
| Item 21 | 1.00 |                                   |
| Item 22 | 1.00 |                                   |
| Item 23 | .95 |                                   |
| Item 24 | 1.00 |                                   |
| Item 25 | 1.00 |                                   |
| Item 26 | 1.00 |                                   |
are included. The last sub-dimension consists of items 5, 7, 8, and 14, and this sub-dimension is named as “avoidance” sub-dimension. Item factor loads of the scale were observed to range from .46 to .78 (Table 2).

Table 3 shows correlation values between the sub-dimensions of the Caregiving Willingness to Pandemic Patients Scale (CWPPS). The data obtained show that there were significant relations between the four sub-dimensions of the scale, there was a high level of correlation between all four dimensions, and there was no multicollinearity problem.

Construct Validity—Confirmatory Factor Analysis
The model fit of the four-factor structure of the scale obtained by EFA was examined with the second-level CFA, and the findings obtained are given in Figure 2. Compliance statistics obtained as a result of CFA were as follows: $\text{CMIN} = 775.675$, degrees of freedom (df) = 203, $\text{CMIN/df} = 3.82$, $P = .000$, goodness-of-fit index (GFI) = .87, adjusted goodness-of-fit index (AGFI) = .85, comparative fit index (CFI) = .92, and root mean square error of approximation (RMSEA) = .073 (Table 4). Standardized regression loadings of the scale items were found to be between .41 and .70 (Figure 2). It is seen that the fit indices of the scale, which consist of 22 items and 4 factors, are significant and the model fit of the scale is at a good level.

Findings Regarding the Reliability of the Scale
The reliability of the scale was evaluated by internal consistency. Item-total score correlation analyses and Cronbach’s alpha values were used to evaluate internal consistency. Item-total score correlation values for the draft scale were between .30 and .61. The Cronbach’s alpha value for the whole scale was determined as .86. Moreover, the Cronbach’s alpha value at the level of subfactors were .80, .74, .76, and .64 for the first, second, third, and fourth factors, respectively (Table 5).

Scoring and Evaluation of the Scale
In evaluating the collectability of the scale items, homogeneous and interrelated, the Tukey’s test of additivity was used. Scale items can be summed up ($P > .05$); it was found to be homoge- neous and interrelated ($P < .05$). The items measure the desired quality to be measured (Hotelling’s T-squared test 2103.961, $F = 96.422$, $P = .00$). It was observed that the order of the questions in the scale was also good (intraclass correlation coefficient .861, $P = .00$).
Figure 2.
Second-Level Confirmatory Factor Analysis of the Willingness of the Caregiving to Pandemic Patients Scale.
Each item in the scale is evaluated in a 5-point Likert scale (1–5 points; strongly disagree, disagree, undecided, agree, and strongly agree). The minimum score that can be obtained from the scale is 22, and the maximum score is 110. High scores for each item show that nurses’ willingness to provide care has increased. In the scale, 5, 6, 7, 8, 12, 14, 16, 17, 18, 19, and 20 items (new item numbers) are inversely scored because they contain negative meanings and expressions. In the evaluation of the scores obtained from the scale, 22–40, 41–75, and 76–110 points show low-, moderate- and high-level willingness to give care, respectively.

In this study, the average score that nurses got from the scale was $70.3583 \pm 14.00232$ (minimum, 23; maximum, 107), and

Table 4.
Model Fit Index Values of the Willingness of the Caregiving to Pandemic Patients Scale

| Criterion | Obtained Values | Expected Values |
|-----------|-----------------|-----------------|
| CMIN/df   | 3.82            | <5.00           |
| RMSEA     | .073            | <.080           |
| CFI       | .92             | >.90            |
| GFI       | .87             | >.85            |
| AGFI      | .85             | >.80            |

Note: df = degrees of freedom; GFI = goodness-of-fit index; AGFI = adjusted goodness-of-fit index; CFI = comparative fit index; RMSEA = root mean square error of approximation.

Table 5.
Item Analyses and Internal Consistency Coefficients of the Willingness of the Caregiving to Pandemic Patients Scale

| Substances                                                                 | Item-Total Correlation | Cronbach’s Alpha |
|----------------------------------------------------------------------------|------------------------|------------------|
| First factor                                                               |                        |                  |
| 6–(6): The physiological and psychological experiences of the patients during the treatment and care process disturb my morale. | .300                   |                  |
| 12–(12): I want my work to end as soon as possible while caring for patients who are infected by the pandemic. | .614                   |                  |
| 16–(16): Standing for a long time while caring for pandemic patients does not tire me. | .363                   |                  |
| 17–(16): Taking care of patients infected by the pandemic is psychologically worn out. | .513                   |                  |
| 19–(17): Having to wash my hands while caring for patients infected by the pandemic makes me tired. | .424                   | .80              |
| 20–(18): Always using protective equipment while caring for patients infected by the pandemic causes me to be reluctant to work. | .545                   |                  |
| 22–(19): Although I take the necessary precautions to prevent transmission, I think the disease will infect me. | .353                   |                  |
| 23–(20): Knowing that I will stay away from my family when looking at patients infected by the pandemic lowers my motivation. | .491                   |                  |
| 24–(21): Taking care of patients infected by the pandemic does not affect my social life. | .304                   |                  |
| Second factor                                                              |                        |                  |
| 2–(2): Seeing that patients infected by the pandemic start to heal increases my commitment to what I do. | .378                   |                  |
| 9–(9): Caring for patients who are likely to recover during the pandemic process provides me with more satisfaction from my work. | .354                   | .74              |
| 10–(10): Taking care of patients infected by the pandemic increases my job satisfaction. | .550                   |                  |
| 11–(11): I believe in the impact of the care I give to patients infected by the pandemic. | .308                   |                  |
| Third factor                                                               |                        |                  |
| 1–(1): I have no difficulty in caring for patients infected by the pandemic. | .456                   |                  |
| 3–(3): Although I worry that it will infect me, I do not hesitate to care for patients with infections that cause pandemics. | .478                   | .76              |
| 4–(4): Working in clinics with diseases with a high risk of transmission will not affect me. | .564                   |                  |
| 13–(13): Learning to care for patients infected by the pandemic does not feel bad. | .602                   |                  |
| 26–(22): I find myself competent to care for patients infected by the pandemic. | .337                   |                  |
| Fourth factor                                                              |                        |                  |
| 5–(5): During the pandemic, I try to be on leave.                          | .382                   |                  |
| 7–(7): Considering that I will carry disease to my family from patients who are infected due to pandemic, I refrain from providing care to these patients. | .412                   | .64              |
| 8–(8): If I have to take care of patients who are infected due to the pandemic, I consider applying. | .430                   |                  |
| 14–(14): I always think about death when caring for pandemic patients.    | .402                   |                  |

Note: *Item numbers in bold and in brackets are the new item numbers after the construct validity analysis.
it was seen that their willingness to give care to pandemic patients was moderate.

Discussion

This research was conducted to measure the willingness of nurses to give care to pandemic patients. Analyses were performed for the validity and reliability of the scale. The validity of the scale was evaluated in terms of structure and scope. Content validity is the creation of a whole consisting of meaningful items that show whether the items in the measurement tool are sufficient in terms of quality and quantity in measuring the property to be measured and whether they represent the field by taking expert opinions (Baydur & Eser, 2006; Büyüköztürk, 2010). Hutcheson and Sofroniou (1999) stated that the sample size is at a good level when the KMO value is greater than .60 and Barlett’s test should be significant and the model fit of the scale was at a good level. In this study, KMO was found to be .88 and the CVI value of .93 obtained for all scale items within the scope of the content validity of the scale shows that there is a consensus among experts.

Exploratory factor analysis was initially performed to examine the factor structure of the scale. In EFA, it is reported that KMO should be greater than .60 and Barlett’s test should be significant (Karagöz, 2019). Hutcheson and Sofroniou (1999) stated that the sample size is at a good level when the KMO value is between .70 and .80, and the sample size is very good when it is between .80 and .90. In this study, KMO was found to be .88 and Barlett’s test χ² values were found to be 3435 and 250 (P=.000), and it was determined that the collected data were suitable for factor analysis and the sample size was very good. In determining the items in the scale in EFA, the item’s eigenvalue should be at least 1 and the item factor loadings should be at least .30 (Fabrigar et al., 1999; Sciresheim & Eisenbach, 1995; Seçer, 2017). It is stated that the total variance rate announced should be at least 40% (Karagöz, 2019). Accordingly, it can be said that the total variance value (50.447%) and item factor loadings (.46–.78) obtained as a result of EFA in this study are sufficient.

DFA aims to verify a predetermined structure. A CMIN/df value < 5 is considered a good fit indicator. If the RMSEA value is below .08, it indicates an acceptable fit (Erkorkmaz et al., 2013; Karagöz, 2019). The GFI and AGFI take values between 0 and 1, and values close to 1 indicate a good fit. It is reported that values of .85 and above for GFI and AGFI and .90 and above for CFI are acceptable fit values in the literature (Erkorkmaz et al., 2013; Schumacher & Lomax, 2004; Seçer, 2017). The model fit of the factor structure obtained in this study was examined with the second-level CFA, and the model fit indexes were sufficient and at acceptable levels (χ² = 775.675, df = 203, CMIN/df (χ²/df) = 3.82, P = .000, GFI = .87, AGFI = .85, CFI = .92, RMSEA = .073).

The reliability of the scale was examined by testing the internal consistency coefficients (Cronbach’s alpha and item-total score correlation coefficient). The Cronbach’s alpha coefficient is the weighted standard average of change found by proportioning the total variance of the items in the scale to the general variance (Tavakol & Dennick, 2011). It is assumed that the higher the alpha coefficient of the scale, the more consistent are the items in this scale (Beaton et al., 2000). A Cronbach’s alpha coefficient of .70 and higher indicates that the test scores are generally good and sufficient for reliability. Further, it has been reported that the lower limit is accepted as .60 and above (Klıç, 2016). The item-total correlation explains the relationship between the scores obtained from the test items and the total score of the test. If the relationship between an item and the scores obtained from the whole scale shows a positive and “high enough” correlation, that item is discriminatory or these items are considered to measure similar behaviors, and the item is included in the scale (Büyüköztürk, 2010; Taşvancil, 2018). In the literature, when interpreting the item-total correlation, it was stated that items with .30 and above differentiated individuals well, the total score correlation values should be .30 and above, and the correlation coefficient was a good value for reliability (Büyüköztürk, 2010). In this study, item-total correlation values were .30–.61, and the Cronbach’s alpha value was .86. In line with the literature, it is believed that all items in the scale are related to the total score of the scale, able to provide item validity and with good and sufficient internal consistency coefficients of the overall scale and its sub-dimensions.

Study Limitations

This research has two limitations. One of them is failure to test the reliability of the data collection tool over time and the other limitation is the use of convenience sampling method.

Conclusion and Recommendations

As a result of the construct validity-EFA of the scale created at the end of this research, KMO value was found to be high and the Barlett’s test was significant. As a result of EFA, a structure consisting of 22 items and 4 factors was obtained, which explains 50% of the total variance. It was observed that the fit indices of the scale consisting of 22 items and 4 factors were significant and the model fit of the scale was at a good level. In scoring and evaluating the scale, it was observed that the items of the scale were summable, homogeneous, and interrelated. The items are capable of measuring the property desired to be measured. As a result of this research, it has been determined that the “CWPPS” is a valid and reliable measurement tool. In line with the results obtained from the study, it is seen that this scale can measure nurses’ willingness to give care to pandemic patients. It is believed that the scale is an easy-to-use measurement tool that can be used to evaluate the willingness of nurses working in clinics to provide care to pandemic patients and for new studies to be planned.

Ethics Committee Approval: Permission was obtained from the Ethics Committee of the KTO Karatay University Faculty of Medicine Drug and Non-Medical Device Researches (decision number: 2020/012).

Informed Consent: Consent was obtained from the participants to participate in the study.

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