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Nurses' adaptation instrument in the oncology wards: Development and psychometric testing

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Abstract:

INTRODUCTION: Understanding adaptation is strongly influenced by the culture and beliefs of every society. By increasing knowledge about the different dimensions which require the adaptation in different aspects requiring the nurse adaptation in oncology, a clear definition of the problem can be stated. Because of the lack of a standard and appropriate tool for the culture of the Iranian society, this aimed at developing and validating the nurse adaptation tool in the oncology departments.

METHODS: This research is a methodological study and an exploratory mixed method being conducted in three main steps of conceptualization, production of items, and field test. Inductive conceptualization was performed through qualitative methodology and conventional content analysis approach; in the second step, developed instrument was evaluated in terms of face validity, content validity, and construct validity. In the third step, sampling of oncology nurses was done and exploratory factor analysis was performed for evaluating the construct validity, adequacy of sampling, and dimensioning. Cronbach's alpha was calculated for checking the reliability of the instrument.

RESULTS: The oncology nurse adaptation questionnaire was formed with twenty items in four main dimensions, including "emotional factors," "supportive factors," "work-related factors in the ward," and "factors related to job conditions." The reliability of the tool was confirmed by evaluating the internal consistency with Cronbach's alpha, which was above 0.7 for each dimension and 0.82 for the whole instrument.

CONCLUSION: This instrument can be used as a practical tool for determining the adaptation of oncology nurses for providing evidence to improve the work conditions of nurses by improving the working conditions in the workplace and providing facilities with individual intervention, and the outcome will be care of patients with high quality.

Keywords:

Adaptation, clinical nurse specialist, neoplasms, psychometrics

Introduction

Oncology nursing is an exhausting and difficult profession psychologically, mentally, and physically.^[1] Many oncology nurses have strong relationships with their patients, which is because of the nature of care in these patients, affecting this job. Sensitivity to patients' needs, giving compassion and kindness, psychological support, empathy, and empathy are the other

causes.^[2] The oncology nursing environment is challenging and unique for nurses because of the physical and psychological stress which cancer patients face. This method of care often causes ethical challenges for oncology nurses.^[3] Such stresses can be caused by factors related to patient care, colleagues, senior nursing managers, and the officials of medical institutions.^[4] Nurses working in the oncology departments are constantly faced with high-stress clinical

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situations.^[3] Among the factors which oncology nurses face in the workplace, causes make them psychological difficulty include long-term and difficult treatment of patients, chemotherapy side effects, surgeries leading to loss, suffering and pain of patients, feeling fear and horror and finally, death.^[5] The mental states of nurses are known to care for patients with cancer, among which the negative psychological effects are highlighted.^[6] Nursing from patients with cancer with an unstable condition has a deep effect on the mental state of nurses, while nurses have no way for expressing these feelings,^[2] and it will result in job burnout, mental fatigue, and a lack of adherence to ethical principles.^[7] Finally, all of these reduce adaptation and interest in working in these departments.^[8] Today, nursing requires constant mental and emotional effort, physical strength, technical skills, and the ability to communicate friendly. Nevertheless, excessive physical and mental activity leads to high levels of pressure during and after work shifts.^[6] Such a feeling leads to physical and mental fatigue.^[8] Oncologists and nurses face the death of cancer patients every day, which is always a difficult issue to deal with.^[9,10] Studies indicated that stress and burnout affect young nurses. On the other hand, progressive stress related to burnout leads to job dissatisfaction.^[11] When a person knows what is required to be conducted while is limited and unable to do so, the nurses' values and beliefs are rejected and their identity and integrity are affected as a morally committed entity.^[12,13] This has a negative effect on the adaptation of nurses, even though the continuation of the job causes a feeling of despair and lack of motivation.^[8] Davis *et al.* argued that job satisfaction is inversely related to emotional fatigue and desire to leave.^[14] In the face of all these stresses, nurses' individual efforts are adapting to the care of cancer patients, such as having a broad and strong relationship with other members of the treatment team, or theoretical and practical training to prevent or return to recovery from work stress. Although it is not enough, the organization's support for nurses should play a complementary role.^[15] Davis *et al.* regarded it positively to regard strategies from the relevant organization and to receive support from colleagues in adaptation of oncology nurses.^[14] Nevertheless, the unknown and unresolved ethical issues lead to instability, confusion, and stress among nurses.^[16] Understanding adaptation is strongly influenced by the culture and beliefs of each community,^[17] and these should be included in the context of the same society that should be studied. Leaving, unwillingness, and motivation to work in such departments or leaving the service are all issues which dominate in most oncology departments.^[8] In his study, Siyazak stated that oncology nurses have suffered from burnout syndrome more than general surgery nurses. The burden of psychological care is higher among oncology nurses.^[6] Therefore, the stress in this type of department is high, and the desire to work in these departments is

low; thus, the requirement to adapt to the stresses of this type of department and learn its specific mechanisms is a serious requirement. In order to achieve this goal, the status of adaptation should be accurately measured. In line with the realization of this goal, a valid tool should be created. Different studies stated the presence of a number of factors related to job stress and burnout among the nurses working in oncology wards and it is prove necessity of adaptation in these wards because of stress and burnout. If nurses want to continue to work in such wards in a quality manner, it is necessary to obtain the necessary adaptation in spite of all of the existing conditions. Nevertheless, the ways to obtain this adaptation and the amount of acquisition of this adaptation are not really transparent, the requirement to conduct a study that determines the degree of nurse's adaptation and how to obtain this adaptation via valid and reliable instrument is strongly felt. By increasing the knowledge in the field of collecting data about the adaptation level of nurses and its adaptation dimensions, the current situation in the departments objectively can be understood more tangibly and quantitatively. In addition, better and more accurate plans can be made by understanding the current situation by Stakeholders in hospitals and universities. On the other hand, based on the review of literature, because of the lack of a standard instrument which fits the culture of Iranians, the present study aims to develop and psychometric nurses' adaptation instrument for working in different oncology wards.

Methods

This was a methodological study which has been performed by exploratory mixed-method study. Instrument development was conducted in the form of three main steps:

First step: Production of items

In order to produce the items, an inductive approach was regarded using the Elo and Kyngäs model.^[18] To understand the concept of nurses' adaptation in different wards of oncology, semi-structured and face-to-face interviews were conducted as follows:

Initially, the participants were selected based on purposive sampling after obtaining a study license and then interviewed in semi-structured interviews in the oncology department in different shifts of the morning, evening, and night and appropriate time (based on participants' preferences). Inclusion criteria for entry in sample selection were nurse working in one of the oncology wards (surgery, chemotherapy, and radiotherapy) for at least 6 months, willingness to participate in the study, and having experience of stress caused by working in these wards. Exclusion criterion was not willing participation

in subsequent interviews if necessary. All of the ethical considerations are taken into account during the study. In the interviews conducted by the researcher, the interview began with the question: "How is it working in the oncology department? How do you feel about that?" Data analysis was performed simultaneously with data collection. As a result, it helped to raise new questions in later interviews.^[19] The interviews continued until data saturation was reached (8 nurses). All of the interviews were recorded with the permission of the participants, and then, the interviews were analyzed by the researcher in accordance with the content analysis method. In order to analyze the data, in the first step of the study, following qualitative interviews, content analysis was used,^[18] which is an appropriate method for examining people's attitudes toward a specific topic.^[20] Qualitative content analysis (inductive) was performed using the three-step Elo and Kyngäs method:

First, the recorded interview was listened to carefully several times and then it was transcript and the interview sentences were read many times to understand its meanings well, and then, the unit of analysis was determined (which can include all the texts of the interview and observations). After that, the meaning units were determined and then condensed and the codes were formed, which means that notes and headings were taken in each study of the analysis units while categories and subcategories were formed. This was repeated until a new category was not formed. These classes were held to enhance knowledge about the phenomenon and the development of knowledge. Finally, the themes were taken on a more abstract level than the classes. In examining the content, both apparent and hidden contents were regarded and studied.^[18,21] The title of the main categories which reached their highest abstract level was the theme of the main dimensions of the phenomenon under study, and finally, the results and analysis process were reported in detail.^[21]

The second step was conducted in the form of initial design of the questionnaire and its validity:

At this step, the extracted codes were listed in the previous step and used as a primary tool to compile the items. The highest possible number of items entered the study at this step so that no data were lost. The pool of items contained 30 items. Qualitative and quantitative face validity, as well as quantitative and qualitative content validity, was performed. Here is a detailed description:

Face validity

In this part, a qualitative and quantitative face validity was performed. In order to perform quantitative face validity, the questionnaire was given to 10 experts (research method, oncology nursing, member

of nursing faculty, and epidemiology). The items were evaluated in form of a five-point Likert scale from not important at all to very important. The item impact score for all of the items above 1.5 was regarded as acceptable. Qualitative face validity was performed for having a clear and concise introduction, logical sequence of items, no typographical errors, logical form of questions, and clarity and intelligibility of items. The questionnaire was given to 5 respondents (oncology nurses) to be evaluated for clarity and comprehensibility and the appearance of the instrument, and changes should be made if necessary.

Content validity

Content validity was evaluated qualitatively and quantitatively. In order to evaluate the qualitative content validity in terms of accuracy and representation of the items, the degree of relationship between concepts, revising or deleting items from the opinions of 10 experts (the same panel of experts who performed face validity) were used. In the present study, the Content Validity Index (CVI) (Waltz and Basel Index) was calculated through 10 experts in the field in order to evaluate the quantitative content validity. In this way, each item was studied in the form of a 1–4 Likert scale in terms of relevance, simplicity, and clarity and was calculated based on the relevant index formula for each item. A score above 0.7 was regarded as the retention of items.^[19]

The third step: Field test

Based on the number of final items, the questionnaire tool was performed in a high sample size (at least four times the number of items) through convenience sampling.^[22] In the present study, sampling was performed about seven times the number of items (200 people). Based on the collected data, the exploratory factor analysis was used to determine the construct validity, the adequacy of sampling (via KMO¹), and instrument dimensioning (Bartlett's test) and, on the other hand, to check the reliability of the tool through Cronbach's alpha data. The results were used, and the criterion above 0.7 was regarded to confirm the reliability of the instrument.^[19]

Rigor

In the first step of the study, following qualitative interviews, the following was performed to ensure rigor:

The four general criteria for qualitative researches to evaluate the reliability of data and findings included credibility, dependability, confirmability, and transferability, each of which can be achieved through the actions which the researcher can use based on his capabilities.^[23]

1 Kaiser-Meyer-Olkin (KMO)

In the present study, the researchers regarded the following items to enhance the validity of the study:

- Prolonged engagement with data and their analysis
- Using audit trial for ensuring the accuracy of the analysis steps
- Member check with participants (during the interview).

In addition, a number of participants were asked to comment on whether the findings were approved or not after analyzing the findings and extracting the data.

Method of calculating the sample size and number for field testing

The sample size was determined based on the number of items in the final shape of the instrument. Therefore, five times the number of items equal to the number of sample sizes was required.

Ethical considerations

Sampling began after approval by the university's ethics committee and obtaining the necessary permits. After introducing himself and mentioning the objective of the study and ensuring the anonymity and confidentiality of

data, the researcher started sampling. The code of ethics of the plan is IR.TUMS.FNM.REC.1396.3591.

Results

Interviews of nurses working in the oncology departments in different related departments continued based on purposive sampling until data saturation (8 nurses). The interviews lasted between 20 and 40 min and were performed in the oncology departments providing patient privacy. Following qualitative interviews, an initial 30-item questionnaire was developed [Table 1].

Face validity

The results of quantitative face validity indicated that the impact score for all of the items was above 1.5. After reviewing the face validity of the tool qualitatively through five respondents, their opinions were applied. For instance, the typing head of the table of items was not applied on the second page, which the researchers paid no attention to, or some items were repetitive in terms of meaning that merged (item 2 with 25 and 27 with 29 had similar meanings).

Table 1: Pool of items

Primary items	<i>n</i>
It is important for me to be interested in working in the oncology department	1
Being intimate with the patient prevents me from adapting	2
The death of patients causes me to lose my spirit to work in the oncology department	3
The destructive physical effects of chemotherapy drugs affect my motivation	4
The negative effects of chemotherapy drugs affect my personal lifestyle	5
My personality type affects my adaptation	6
Emotional indifference to patients can be helpful	7
Controlling the emotions is important	8
Accepting the issue of death as a natural process affects my adaptation	9
The tightness of the oncology departments prevents adaptation	10
The difficulty of working in the oncology department affects my adaptation	11
It is important to regard the rewards and benefits of working in these departments	12
Compulsory work in oncology departments reduces motivation	13
With the increase in work experience, I have come to the conclusion that it is better to avoid excessive contact with patients	14
The cooperation and intimacy of the supervisor and staff is a positive factor in my adaptation	15
Reducing chemotherapy shifts will enhance my job satisfaction	16
It is important for me to have fun outside of the department	17
Having a happy and carefree life affects the quality of my work	18
Holding preparation classes in oncology departments at the beginning of employment is effective for my adaptation	19
It was necessary for me to take communication courses when I started working in these departments	20
It is necessary to enhance the number of nurses present at the shift	21
Proper management of the person in charge of shifts is important to me	22
At the beginning of the work in this department, there is a requirement for help for adaptation	23
Obtaining a specialized qualification certificate when starting work in oncology departments is essential	24
It is important not to be too intimate with the patient.	25
Employing nurses with high work experience affects adaptation	26
It is necessary to change the departments after working in these departments for a while	27
The variability of shifts between oncology outpatient clinics and admission wards is important	28
It is important for me to change the working department at regular intervals	29
It is important for me to participate in clinical decisions	30

Content validity

After reviewing the quality of the content, the panel of experts confirmed the connection of all of the items with the structure and some items were reviewed for additional verbs and letters. Quantitative content validity was calculated by CVI (Waltz and Basel Index) by 10 experts in the fields of nursing, oncology, research methods, and epidemiology. For the items which scored 0.7–0.8 (items 4, 5, 7, 10, 11, 17, 21, 26, and 28), changes were made and the CVI score was recalculated. It was significantly improved (above 0.7), and two items which scored <0.7 were omitted (items 5 and 24). At this step, a 26-item questionnaire was formed [Table 2].

In the next step, the prepared questionnaire was scored as a Likert and was given to 200 nurses (more than five times the items). The study findings revealed that 21.5% of the participants had less than a year of experience, 23% had 1–5 years, 20% had between 5 and 10 years, and 35.5% had more than 10 years of work experience. More specifically, the work experience in oncology departments was 24.5% for <1 year, 36% between 1 year and 5 years, 16% between 5 and 10 years, and 23% over 10 years. Ninety-two percent of the nurses had a bachelor's degree in nursing and the others had a master's degree.

The exploratory factor analysis of the data was done. This was performed to evaluate the construct validity

and the dimensioning of the designed questionnaire. In order to test the validity of the data for the analysis factor, two tests, KMO and Bartlett's test, were performed. The KMO test studies the adequacy of sampling, and the latter examined the sphericity. Results show that KMO was 0.62 and Bartlett's test was 0.000, both of which were acceptable. It indicated that sufficient sampling was performed and the factor analysis provided an acceptable model and was able to resize items. Initially, the analysis was calculated with the lowest factor of the factor which resulted in nine dimensions, and then, based on the results of the higher factor (0.4), since the scree plot indicated four dimensions, the calculation was reformed with four dimensions. The cumulative variance for these four dimensions was 40%, indicating the highest total variance observed. Regarding the load factor of 0.4, items 6, 15, 25, and 12 were initially omitted. Items 16, 3, and 13 were cross-loaded, and although item 16 was 0.64 in the second dimension and 0.4 in the fourth dimension of the rotate component matrix, for instance, they were omitted in the first dimension because of its change in position in the component matrix table. Finally, based on the maximum load factor, questions 1, 7, 8, and 9 were placed in one dimension; questions 2, 4, 5, 10, 11, and 14 were placed in one dimension; questions 17, 18, 19, 6, and 20 were placed in one dimension; and questions 21, 22, 24, 23, 26, and 26 were placed in the last dimension. The name of the dimensions was determined based on the

Table 2: Table of items before performing exploratory analysis factor

Items	n
It is important for me to be interested in working in the oncology department	1
Excessive intimacy with the patient is not acceptable	2
The death of patients causes me to lose my spirit to work in the oncology department	3
The destructive physical effects of chemotherapy drugs will reduce my motivation	4
Compulsory work in oncology departments reduces motivation	5
My personality type affects my adaptation	6
Emotional indifference to cancer patients is essential	7
Controlling the intensity of emotions is essential in dealing with patients	8
Accepting the issue of death as a natural process can be helpful	9
High stress in the oncology department prevents me from adapting	10
The difficulty of working in the oncology department is unpleasant for me	11
Regarding additional rewards and benefits helps to enhance the motivation to work in these areas	12
Obtaining a specialized qualification certificate when starting work in oncology departments is essential	13
With the increase in work experience, I have come to the conclusion that it is better to avoid unnecessary communication with patients	14
The cooperation and intimacy of the supervisor and staff is a positive factor for me	15
Reducing chemotherapy shifts will enhance my job satisfaction	16
Having fun outside of the box is important in improving the quality of my work	17
Having a happy and carefree life affects the quality of my work	18
It is essential to have preparation classes to start working in oncology departments at the beginning of employment	19
It is important for me to take communication courses when I start working in these departments	20
It is important to enhance the number of nurses in each shift	21
Proper management of the person in charge of shifts is important to me	22
Varying shifts in outpatient clinics of oncology and admission ward are essential	23
Nurses with high work experience are better suited to work in these departments	24
It is necessary to move oncology nurses in different departments (rotation)	25
It is important for me to participate in clinical decisions	26

common meaning of the items related to that dimension. The first factor was called "emotional factors," the second factor was "factors related to work in the department," the third factor was "supportive factors," and the fourth factor was "factors related to working conditions." The final questionnaire included 20 items. The final 20-item questionnaire took an average of 10–15 min to complete. It was scored as a Likert (completely disagree = 1, disagree = 2, neither disagree nor disagree = 3, agree = 4, and completely agree = 5). The minimum possible score from this questionnaire was 20 and the maximum was 100. Higher scores mean more adaptation. Scoring for items 7, 8, and 9 was reversed. The reliability of the instrument was calculated by examining its internal correlation by calculating Cronbach's alpha for each of the dimensions above 0.7 and its total internal correlation by 0.82, which was an acceptable amount [Table 3].

Discussion

This study aimed to design and validate instrument for evaluating the adaptation of nurses working in different oncology wards. The questionnaire was composed of twenty items in four dimensions: emotional factors, work-related factors in the department, supportive factors, and factors related to working conditions. The discussion is into qualitative and quantitative parts:

Qualitative part

In this section, the different dimensions of the instrument are discussed:

"Emotional factors" discusses how emotions are expressed and how they relate to the patient, how they deal with death, and their interest in working in oncology wards. Davis *et al.* stated that emotional fatigue is lower among young nurses and nurses working in nonnursing wards. Job satisfaction was inversely related to emotional fatigue and a desire to leave the job.^[14] Then, "factors related to working in the department" deals with the difficulty of work and stress in oncology, nonwork communication, forced labor in the department, and the devastating effects of chemotherapy drugs. In order to prevent or return to recovery mode, it is necessary to achieve compatibility in

Table 3: Cronbach's alpha for the whole and each dimension of the nurse adaptation questionnaire in the oncology wards

Cronbach's alpha	Mean (SD)	Number of items	Dimensions
0.71	18.8 (3.33)	5	Emotional factors
0.75	20.2 (2.2)	5	Factors related to work in the department
0.75	21.7 (1.7)	5	Supportive factors
0.78	16.5 (1.5)	5	Factors related to working conditions
0.82	15.4 (1.7)	20	Total

SD=Standard deviation

this field.^[15] The dimension of supportive factors includes personality-type items, happy life, and having fun outside the workplace, passing communication courses at work. Gillman *et al.* stated that there is a supportive role in the adaptation of nurses. In addition, Davis mentioned the spiritual support of his colleagues as a source of support.^[15] Finally, the "dimension of factors related to working conditions" includes the number of nurses present in the shift, the management in charge of the shift, the change of department between the outpatient clinic and the inpatient department, and the nurses' work experience. Regarding the department in which the nurse works, Siyazak stated that oncology nurses had more burnout syndrome than general surgery nurses.^[6] Although different domestic and foreign researches related to the disappearance, depression, anxiety, and adaptation of nurses, especially nurses working in oncology departments, have been conducted by searching different texts, while a questionnaire which has studied the level of adaptation and barriers and supportive factors in Iran and/or not found in other countries. As a result, it is not possible to compare it with other instruments.^[1,3,6,14]

Quantitative part

In this section, the quantitative part of the study is discussed:

The psychometric instrument indicate that it is valid and reliable tool. The validity of the tool was evaluated by face validity, content validity by CVI calculation (Waltz and Basel Index), and structural validity (through exploratory analysis factor) and its reliability by Cronbach's alpha calculation for Internal consistency.^[19] Face validity was done regarding the respondents' opinions on the appearance of the table and the integration of items which were semantically identical. Regarding the content validity of each item, it was studied in terms of relevance, simplicity, and clarity, and items under 0.7 were removed and changed between 0.7 and 0.8, and expert opinions were applied. Construct validity was performed by analyzing and dimensioning the items, and the results of KMO and Bartlett's tests indicated that the data provided an appropriate model.^[24] Finally, four dimensions of emotional factors, factors related to working conditions, supportive factors, and factors related to work were obtained in the department. The reliability of the tool was evaluated by calculating Cronbach's alpha for each dimension and the total tool, which for all of the dimensions was above 0.7 and the total was 0.82, being an acceptable amount.^[19]

Executive limitations of plan and their reduction

Since most of the items were extracted from the interviews and a qualitative study was conducted, it would have been better to conduct the interviews separately in different cities as well as in private and public hospitals (because

of differences in salaries and benefits between the two), so that it is possible to study different perspectives in accordance with the prevailing culture, which was not possible because of the conditions of the researcher.

Conclusion

Based on the data obtained and the results of the questionnaire made in the present study on oncology nurses, top-, middle-, and even low-level managers can plan better to enhance the level of adaptation of nurses while retaining physical and mental health and improving job conditions. In the workplace, facilities should be provided as much as possible in order to provide better care for oncology patients.

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Conflicts of interest

There are no conflicts of interest.

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