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RESEARCH ARTICLE

DEVELOPMENT OF FUNCTIONAL HEALTH PATTERNS-BASED PERCEIVED HEALTH SCALE (FHP-PH) AND INVESTIGATION OF ITS PSYCHOMETRIC PROPERTIES

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ABSTRACT

Purpose: The present study aimed to determine the health patterns in the general population by developing the "Functional Health Patterns-Based Perceived Health Scale (FHP-PH)". This study, it was aimed to develop a measurement tool that will facilitate subjective data collection both in the clinic and in field studies.

Material and Methods: In the study, the trial form with 92 items was applied to a sample including 655 people. Exploratory factor analysis and confirmatory factor analysis were performed to determine the construct validity and 27% lower-upper group comparison was carried out to determine internal validity.

Results: The developed FHP-PH scale consists of 3 subscales and 26 items and can account for 50.6% of the total variance. The total score of the scale ranges between 26 and 130 and higher scores signify a positive perception of health. The Cronbach's α reliability coefficient of the scale was calculated as .89, which indicates high reliability.

Conclusion: The developed FHP-PH scale is valid in terms of scope and content and has high reliability.

Keywords: Functional health patterns, nursing, reliability, validity

INTRODUCTION

The nursing process is a widely accepted scientific method for guiding individualized quality nursing care. In developed countries, the nursing process started to be introduced as a systematic and scientific approach to patient care in the early 60s (1–4). In Turkey, the use of the nursing process has become compulsory with legal regulations (5).

There is a consensus that working with the nursing process offers benefits in ensuring professionalization of nursing, being autonomous, and increasing patient care quality and visibility (1,2,6). However, it is also a known fact that there are

difficulties in the implementation of the nursing process and it is not used sufficiently (6–11). The problem of the visibility of nursing has been discussed in professional platforms for years, and the studies of search for an answer to the question of how to make it visible is one of the most important issues that constitute the agenda of nursing keeping up-to-date (6,12–16).

Although there are various reasons for this problem, it is thought that one of the most important factors is that all steps of the nursing process cannot be made measurable. Therefore, the measurability of care processes is substantially important both in the evaluation of the care given, in the early detection of problems and in conducting further studies. In addition to theoretical evaluations and practical reflections, it is crucial to focus on the measurement characteristics of all stages of the nursing process and to develop and use reliable and validated measurement tools (8,12,14,15,17). Studies have revealed that the most difficult stage experienced by nurses while using a care plan is the data collection stage (3,7,18–20).

Nursing process consists of five consecutive components including data collection, diagnosis, planning, implementation, and evaluation. Data collection is the starting point of diagnosis, which is the first step of the nursing process. Data collection is the planned and systematic collection of information about the patient's past and present health status and functionality. Data collection is collecting information about the patient and verifying, organizing, interpreting, and reporting this information. While data collection forms the basis for other steps of the nursing process, it should be performed in a holistic way, including its physical, psychological and social aspects (1,21). Data collection enables the nurse to identify and diagnose the patient's problems, to plan the necessary interventions, to determine the urgent needs of the person, to evaluate the prognosis of the disease, to assess the care given, and to contribute to medical decisions and the multidisciplinary team through information communication (1,2,19,21,22).

It is thought that one of the reasons for the difficulties faced in data collection is the lack of measurement tools with sufficiently structured validity and reliability. When the literature is examined, very few studies have been found concerning data collection tools that are tested in validity and reliability about data collection with the holistic approach, which constitutes the first step of the nursing process, and can also be used in studies (23, 24, 25). In a systematic review examining the assessment tools with validity and reliability used in nursing practices in Italy, 101 tools were examined, but it was determined that there were a limited number of validated tools. Therefore, it has been recommended to encourage validity and reliability studies of the tools used in clinical practice (26).

Data collected from a healthy or sick individual can be subjective and objective. There has been a paradigm shift in the measurement of clinical outcomes in recent years. In order to support the objective data of clinicians (imaging, laboratory results), attention has been paid to the patient's perspective and outcome measures reported by the patient have begun to be developed (27,28). The basis of these criteria is the subjective data obtained from the patients. Subjective data includes what the individual says, complains, concerns, and expects. In other words, subjective data are individual's definition for their perceived health status. Subjective data collection tools are not a ‘subjective’ opinion, but an ‘objective’ assessment that measures the health status, function, or disease severity as perceived by the patient'. These data are always crucial in the early diagnosis of diseases and in guiding the nurse to collect objective data (28). This further increases the importance of developing reliable data collection tools that report the health status of individuals.

Although nurses use various methods to obtain objective data in the field and clinical practices, a limited number of studies determine how individuals evaluate their health status from their own perspective have been found (29,30). It is seen that the perceived health scale is widely used to evaluate health in studies. In this scale, the perception of the individuals about their own health is generally evaluated but it cannot be determined in which area of health the problem is experienced.

The aim of the present study was to develop the functional health patterns-based perceived health scale, which will facilitate subjective data collection on the health status of individuals both in the clinic and in field studies, and to examine its psychometric properties. It is anticipated that the developed scale not only facilitates data collection on individuals but also can be used for determining which areas face with problems and evaluating responses to nursing interventions. This developed scale is based on the Functional Health Patterns Model. The developed Functional Health Patterns-Based Perceived Health

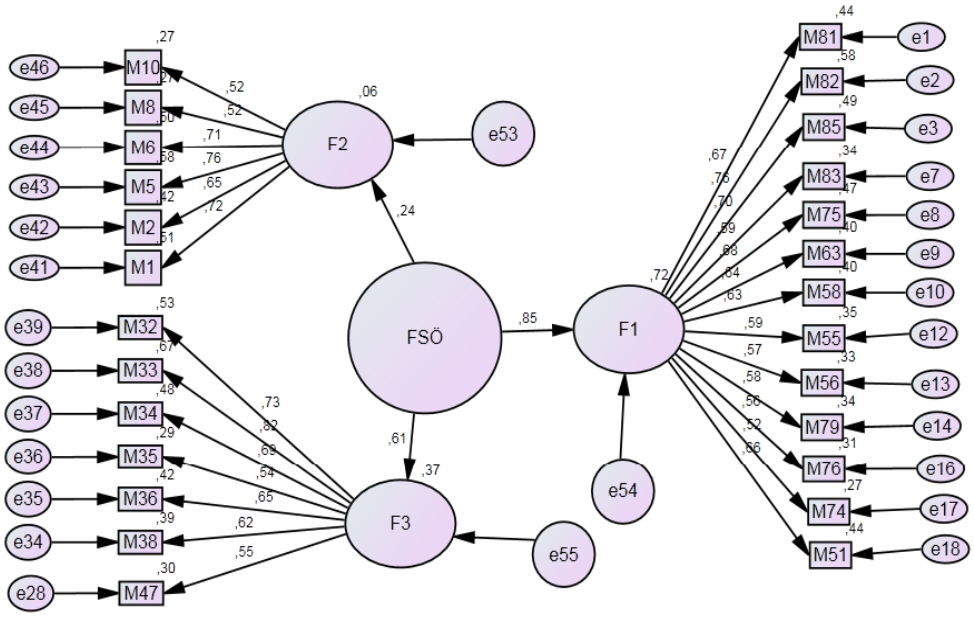

Figure 1. The results of 2nd Level multi-factor CFA indicating 3-factor structure of the trial form

Scale (FHP-PH) scale has an important function in terms of facilitating data collection about individuals, as well as ensuring to assess the responses to nursing interventions. The FHP-PH scale provides valuable information about individuals' own health. The data obtained before and after an intervention to an individual can be used in various studies. In addition, the use of FHP-PH can help identifying real or potential health problems and evaluating nursing care outcomes. The FHP can also provide information to nurses and patients about responses to illnesses or changes in health status over time. These data can be useful in longitudinal studies. In addition, it is thought that it will have an important function in terms of contributing to the visibility of nursing care by this way.

MATERIAL AND METHODS

Purpose of research and type

This is a methodological study. In this study, it was aimed to develop a measurement tool that will facilitate data collection based on individuals' own perceptions both in the clinic and in field studies.

Development of the FHP-PH scale

Included the following steps; examination of the theoretical structure, ethical practices, writing down items, language and psychometric checks, expert opinion, preparing the draft form, pilot application, preparing the trial form, applying the trial form to sample, findings (validity and reliability) and putting the scale into final form.

Examination of the theoretical structure

At this stage, the literature on the concept of functional health patterns was examined and it was attempted to draw the conceptual framework of the subject. For this purpose, Functional Health Patterns Model developed by Gordon and examined under 11 domains was taken as basis. The FHP model was developed by Gordon in 1982. The goal of this model is to make a comprehensive bio-psychosocial examination for individuals and to collect information in a systematic and standardized way by analyzing it from nursing perspective. Model is grouped under 11 functional domains including health perception-health management, nutritional-metabolic, elimination, activity exercise, sleep-rest, cognitive-perceptual, self-perception, role-relationship, sexuality-reproductive, coping-stress tolerance, and value-belief (31,32).

Table 1. Factor values and variance percentages of FHP-PH scale

Factors	Eigenvalue	Variance Percentage (%)	Total Variance Percentage (%)
Factor 1	7.23	29.8	29.8
Factor 2	2.95	11.4	41.2
Factor 3	2.44	9.4	50.6

* Factors were not named

Ethical practices

In order to conduct the study, firstly, "Ethics committee approval (date 21.09.2020 and session number 2020/12)" from Artvin Coruh University Ethics Committee and informed consent from the study participants were obtained.

Writing down items

The question pool was prepared via the literature review and by consulting expert opinion. During the literature review, the relevant literature was scanned and the statements that could be suitable for Gordon's Functional Health Patterns Model were included in the item pool. In addition, academicians who are experts in the relevant field (5 academics in the field of nursing) were consulted and their opinions were taken and the expressions they suggested were added into the question pool. During the item writing stage, it was ensured to add as many statements as possible into the item pool, and a total of 134 positive and negative statements were collected in the question pool after these processes.

Language and Psychometric checks

The psychometric and language validity of the items which were crudely collected in the question pool were examined together with an expert in the field of Turkish Education and preliminary examinations of the items were performed. As a result of the necessary investigations, some items were thought to be inappropriate in terms of linguistic and psychometric aspects and they were removed from the question pool. As a result, 120 items remained in the question pool.

Expert opinion

For the purpose of content validity, the draft form consisting of 120 items collected in the question pool as a result of language and psychometric checks was sent to 10 experts, all of whom were academicians statistician (1), measurement and evaluation specialist (1), psychologist, sociologist (1), nurse (6) and experienced in scale development studies, to ask expert opinion. The number of questions was reduced to 112 after the necessary revisions were made following expert recommendations. Later, this form was sent to 4 academicians working in the field of Turkish Education in order to evaluate in terms of Turkish language validity, their opinions were taken and the questionnaire was corrected in terms of Turkish language. After these corrections, an item pool containing 100 items was obtained. The question pool was sent to 8 experts in the field of nursing. The question pool was sent to 8 experts in the field of nursing. According to expert opinions, the content validity criterion was calculated as 0.75 and the content validity index was 0.88. These findings show that the trial form provides content validity.

Preparing the draft form

By receiving expert opinion, the item pool was transformed into a 5-point Likert type form including the responses of "Not suitable for me", "Not suitable", "Moderately suitable", "Suitable" and "Completely suitable". Likert type form was used in this study as it is convenient for data collection. Likert type scales are widely used in tools that measure thoughts, beliefs, and attitudes (33). Likert type scales are scales in which statements can be responded at various degrees. It is one of the methods for placing individuals on the psychological dimension according to a predetermined stimulus, criterion or set of criteria (34).

Pilot application

After creating the question pool and examining the language and psychometric validity of the attitude statements, a pilot study was conducted with a group of 75 people with similar characteristics to the study sample in order to determine whether or not the sample understand these statements correctly. It is stated in the literature that 30-50 people are sufficient for pilot application (35). After the pilot application, it was determined that there were expressions which were not understood or were misunderstood, and 92 items remained in the item pool after revisions were completed.

Establishing the trial form

In the 92-item trial form, positive and negative questions were given in a mixed order to prevent the possibility of the questions from directing the respondents. The trial form was rated as 5 = "Not suitable for me", 4 = "Not suitable", 3 = "Moderately suitable", 2 = "Suitable", 1 = "Completely suitable" in the positive question items in the form.

Applying the trial form to sample

The data collection stage of the study was carried out in an online environment to prevent infection of the disease because of the Covid-19 pandemic occurring in Turkey and over the world. Data were collected

Table 2. Factor items and factor loading values of Items

Factor I		Factor II		Factor III	
Item No	Factor Loading	Item No	Factor Loading	Item No	Factor Loading
1	.814	*14	.786	20	.834
2	.742	*15	.773	*21	.769
3	.719	*16	.750	22	.766
*4	.708	*17	.722	23	.691
5	.651	*18	.633	24	.645
6	.647	*19	.623	25	.615
7	.646			26	.577
*8	.625				
9	.614				
10	.606				
11	.583				
12	.578				
13	.566				

* Factors were not named

after sending the prepared data collection forms to the individuals aged between 18 and 65 years and observing the principle of voluntary participation. Study data were collected electronically by using Google Form. Throughout the data collection process, the individuals who constituted the population were communicated with through smartphone applications such as WhatsApp and Telegram.

Inclusion Criteria

- ✓ Individuals aged between 18 and 65 years who accepted enrollment in the study.
- ✓ Individuals aged between 18 and 65 years whose primary language was Turkish

Exclusion Criteria

- ✓ Individuals who have any problem in communication (sight, hearing, or mental disability)
- ✓ Individuals who have not completed the research data

The trial form prepared for this purpose was transferred to the online environment and the link of the study was delivered to the participants through various online platforms and they were asked to fill the form. With this method, it was aimed both to eliminate the risk of infection and to reach the large sample size desired for scale development studies.

There are various suggestions in the literature regarding the sample size to be included in scale development studies. One of them is the 10 rule. Accordingly, there should be at least 10 participants per variable (36). Comrey and Lee (2001) state that 50 is very poor, 100 is weak, 200 is medium, 300 is good, 500 is very good and 1000 is excellent for adequate sample size in factor analysis (37). In addition, Kaiser-Meyer-Olkin (KMO) test is performed to determine the adequacy of the data obtained from the sample. As KMO value gets close to 1, it is considered as excellent, if it is below 0.50, it is unacceptable (0.90s are excellent, 0.80s are very good, 0.70s and 0.60s are moderate, 0.50s are poor) (38). In this study, a sample size above 500 and a KMO value of 0.891 indicated a very good sample size. The data acquired from the sample were at a sufficient level, in conformance with the requirement. The 92-question trial form, which was put into final form after obtaining expert opinion, was applied to 722 people from different age and education groups and different socioeconomic levels. The sample of the study consisted of 655 people because there were individuals who gave incomplete answers to the questionnaires or were excluded from the study because the control questions did not match. In this study, the sample size was about 7: 1 case / variable, the sample size was > 500 and the KMO value was 891, indicating that the sample size was adequate.

During the data collection phase, voluntary participation was provided to the study, and individuals aged between 18 and 65 years (X = 29.6; Ss-11.345) who were at least primary school graduates were included in the study. While 79.7% of the sample consisted of women, 68.9% were single and 89.6% had nuclear families.

Validity and Reliability

In this study, “Principal Component Analysis”, which is one of the Explanatory Factor Analysis techniques, was used for determining the construct validity of the FHP-PH scale, and the “direct-oblimin technique”, which is one of the “oblique” techniques, based on the assumption that the factors are related to each other was employed as the factor rotation technique. The resultant structure was tested by using Confirmatory Factor Analysis in AMOS 23 program. EFA and CFA were done simultaneously in order to put a better model out there. For internal validity of the scale, a 27% lower-upper group comparison was performed. For the reliability of the scale, Cronbach’s Alpha was

Table 3. 27% lower and upper-group comparison of the scale

Factor	Group	n	Mean	Standard Error	t	p
Factor 1	Lower Group	176	15.1	1.668	-55.999	.000
	Upper Group	176	38.1	5.191		
Factor 2	Lower Group	176	8.6	1.462	-46.575	.000
	Upper Group	176	19.9	2.846		
Factor 3	Lower Group	176	8.1	1.060	-39.905	.000
	Upper Group	176	21.5	4.315		
FHP-PH Total	Lower Group	176	36.3	4.080	-59.295	.000
	Upper Group	176	72.4	6.992		

Table 4. Additivity analysis of FHP-PH Scale

		KT	Sd	KO	F	P
Inter-Groups	Inter-Items	4903.36	654	7.50		
Intra-Groups	Remainder	1861.05	25	74.44	82.938	.000
	Non-additivity	2.822	1	2.822	3.145	.076

used as well as split- half consistency. The content validity analysis, performed using Davis' technique, revealed the validity of items in the range of 0.81–1.00, and the content validity index was deemed acceptable for all the items.

RESULTS

In this section, preliminary statistics as well as findings regarding the validity and reliability of the scale were included.

Preliminary statistics

At this stage, firstly it is recommended to perform the normal distribution of the data, item-total correlations, calculation of Kaiser-Meyer-Olkin (KMO) coefficient, and Bartlett's test of sphericity, respectively in order to investigate the suitability of the data set to factor analysis (34,39).

Ensuring normality assumption

In providing normality assumption, kurtosis and skewness values were checked by examining the data obtained from 655 people. In the control performed, it was examined whether or not the kurtosis and skewness values were within acceptable limits (Skewness<2. Kurtosis<7) according to the literature (36). In this review, it was determined that 12 items out of 92 items violated the normal distribution and were omitted from the study. Thus, 80 items remained.

Calculation of item correlation coefficients

In scale development studies, it is the identification of the correlation between the total scores of the scale/test and the scores of each item (36). If the item-total score correlation coefficient is below .30, it should be considered that there is a problem with the item or it should be changed or removed from the scale. For this purpose, item-total correlations of 80 items were examined and 16 items with a value below .30 were omitted from the study. Thus, 64 items remained. The correlation coefficient of the remaining items varies between 39 and .83.

Kaiser-Meyer-Olkin (KMO) coefficient, Bartlett's test of sphericity and Determination Coefficient

The KMO coefficient provides information if the data matrix is suitable for factor analysis and about suitability of the data structure for factor extraction. KMO is expected to be higher than .60. If the calculated chi-square statistics are significant, it is an indicator for the convenience of data matrix. The Bartlett's test of sphericity examines the presence of a correlation between variables on the basis of partial correlations. Significance of the calculated chi-square statistics can be seen as the proof of the normality of the scores (39). The KMO value for 64 items included in the evaluation was .90, the Bartlett test result was 6635.499 (p <.0001) and the Determination Coefficient was 3.378. These values show that the trial form is suitable for factor analysis.

Validity

The validity of the scale was tested by examining its construct validity and internal validity. Exploratory factor analysis and confirmatory factor analysis were performed to determine the construct validity, and 27% lower-upper group comparison was performed for internal validity.

Construct Validity: First, exploratory factor analysis was conducted to determine the construct validity. Exploratory factor analysis is a process in which is used to determine how many titles the items (variables), which are prepared as a draft and found in an applied measurement tool would be gathered under, and aims at identifying factors with reference to correlations between variables, and is a method that is frequently used to examine the construct validity of the scale (39–41). When determining the number of factors to be included in a scale, the eigenvalue of each subscale in factor analysis should be at least 1 and above, and account for at least 5% of the variance. In addition, the view that the variance explained by the scale is greater than the variance it cannot explain is accepted as the basic principle (41). In this study, these criteria were attached maximum importance.

While determining the factors, attention was paid that each factor had an eigenvalue greater than 1 and could account for at least 5% of the variance, the total variance was above 50%, and items were selected accordingly. In addition, it was seen that the line chart lost its slope after the 3rd factor and it was decided that the scale could consist of 3 factors, each of which explains at least 5% of the variance and has an eigenvalue greater than 1.

After examining the line chart, factor loading values and the explained variances, item selection was performed by factor analysis over the 3-factor structure of the scale. Factor analysis is a multivariate statistic aiming to find and discover a small number of unrelated and conceptually meaningful new variables (factors, dimensions) by bringing p related variables together (39). Various criteria are suggested in the literature for the item selection process in factor analysis. The first of these criteria is related to the item factor loading value. Items' factor loading values of 0.45 and above is a suitable criterion for selection, but this value can be as low as 0.30. In this study, items with a factor loading value of ≥0.50 were selected by acting more strictly in item selection. The second criterion is that items have a high loading value in a single factor and a low loading value in other factors. The difference between two high loading values is recommended to be at least .10 (39,41). In this study, this criterion was considered and items with at least .10 values between two loading values were assessed as overlapping items and were not processed. As a result of factor analysis, 15 items with factor loading value below .50 and 10 overlapping items were excluded from the study. After this process, a structure consisting of 3 factors and 39 items with eigenvalue greater than 1, explanation variance of at least 5% and total explained variance over 50% was obtained. The 3-factor structure obtained after this stage was subjected to the 2nd level multi-factor confirmatory factor analysis in the Amos 23 program, and the construct validity test of the factors was examined by conducting DFA and CFA together.

The structure with 3 subscales and 39 items obtained as a result of EFA was examined with CFA in terms of model fit and it was determined that the factor loading values of some items were quite low and did not fit with the model. In addition, the goodness of fit values of the model was not at the desired level, so the incompatible items were deleted. These processes continued until appropriate goodness of fit values for CFA were obtained and suitable factorization was achieved for EFA. After this process, 13 items were omitted from the model and goodness of fit values of a construct consisting of 3 subscales and 26 items were obtained. It was observed that the factor loadings of the items in the scale varied between .52 and .89. According to the findings, the measurement model regarding the scale was confirmed as a result of the obtained fit indices. Accordingly, the fit indices for the 2nd level multifactorial structure were established as $\chi 2$ =837.53, $\chi 2$ /df =2.88, NFI= 0.92, TLI= 0.90, CFI=0.96, GFI= 0.94, AGFI= 0.90, RMSEA= 0.05, and RMR= 0.05. The goodness of fit values obtained as a result of the second level CFA showed that it was

Table 5. Findings belonging to internal consistency of FHP-PH scale

Factor	Number of Items	Cronbach's α
Factor I	13	.89
Factor II	6	.81
Factor III	7	.84
Total	26	.89

compatible with the proposed 3-factor model and acceptable (Figure 1).

In the resultant 3-factor scale, it was determined that the first factor explained 29.8% of the total variance, the second factor explained 11.4% of the total variance, and the third factor explained 9.4% of the total variance. All three factors were found to explain 50.6% of the total variance. These determined percentages indicated that the variance explained by the factors separately and together was sufficient (Table 1).

As a result of the item selection process for factors, a scale with 3 subscales and 26 items was obtained. The first factor consists of 16 items, and the factor loading values of the items range between .566 and .814. The second factor consists of 6 items and the factor loading values of the items vary between .566 and .786. The third factor consists of 7 items and the factor loading values of the items range between .577 and .834 (Table 2).

Internal validity: The items which were decided to remain in the scale were tested via “independent samples t test” if they had internal validity. The test scores obtained from the scale were sorted in ascending order, and 27% of the sample including 655 participants was found to be 176 people. Then, according to the scale score, 176 people with the lowest score were re-coded as “lower-group” and 176 people with the highest score were re-coded as upper group. The people in between were not included in the process. After this process, the significance of the difference between the lower group and the upper group was examined by "independent samples t test". When the findings of the internal validity of the FHP-PH scale were examined, it was determined that the difference between the mean scores of the lower group and the upper group showed a significant difference both in the sub-scales and in total mean score of the scale ($p < 0.001$). According to this finding, it can be asserted that the FHP-PH scale differentiates individuals with positive health patterns from individuals with negative health patterns, in other words, it has internal validity (Table 3).

The additivity property of the FHP scale was tested in order to determine whether the scale can be evaluated over the total score or not. According to the findings, it was identified that the items forming the FHP scale were homogeneous and interrelated expressions ($F = 82.938$; $p < .001$). In addition, the test was found to be additive ($F=2.822$, $p > .05$) (Table 4).

Reliability

In Likert type scales, first of all, internal consistency should be ensured. Internal consistency is about to what extent the items of the scale are compatible with each other. The most convenient way to achieve this is to calculate the Cronbach’s α reliability coefficient (42,43). In this study, Cronbach's α reliability coefficient and split-half test consistency were calculated in order to test the reliability of the scale.

Cronbach’s Alpha

Reliability coefficients can be calculated using different methods in the development of measurement tools developed to measure cognitive and affective characteristics. One of these methods is the Cronbach’s Alpha (Cronbach’s α) reliability.

In this study, Cronbach’s α value was calculated between .81 and 89 for both sub-subscales of the scale and the overall scale. These determined values showed that the items in the scale have high reliability and are intended to measure the same attitude (Table 5).

Split-Half-Test Consistency

For the reliability of the scale, the split-half-test consistency of the scale was calculated in addition to the Cronbach’s α reliability coefficient. The reason for using this method is that it is predicted that changes will occur in the health patterns of the sample depending on time. Therefore, it was thought that using methods such as test-retest would be inconvenient and this method was used. In order to apply this method, the odd-numbered items in the scale were grouped into a group and the even-numbered items into a group. Then, the total scores of these groups were obtained and the correlation between the two groups was examined. In this process, the correlation between the groups is expected to be significant. In this study, the correlation between the groups of the scale, whose split-half test reliability was examined, was found to be statistically significant ($r=.66$; $p=.000$). According to this finding, it was determined that the scale obtained was reliable and reliably measured the functional health patterns of individuals.

DISCUSSION

In this study, the validity and reliability of the FHP-PH scale were conducted to measure the subjective perception of health of individuals in the general population, and the psychometric properties of the

scale were examined. The developed FHP-PH scale is valid in terms of scope and content and has high reliability. While examining the factor structure in the data analysis stage of the FHP-PH scale, the researchers used EFA and CFA techniques together, thus they tried to reveal the targeted structure in the most accurate way. Although there are different opinions regarding the determination of the number of factors in scale development studies, the common opinion is that the explained variance is higher than the unexplained variance. In addition, it is recommended that the eigenvalue for each factor should be less than 1 and the explained variance should be at least 5% (41). For this reason, these principles were taken into account in this scale and attention was paid to the variance rate explained to be higher than the unexplained variance. It can be asserted that the 3-factor scale structure with the obtained eigenvalue of the scale greater than 1 provides the necessary conditions since it has a variance of 50.6%. Further, the previous studies indicate that the amount of variance explained by the scales should be higher than the amount of variance that it cannot explain (41). The explainable variance of 50.6 was evaluated as a sufficient value of variance in this sense.

The factor structure of the scale was examined by conducting exploratory factor analysis. In this regard, the literature recommends performing the KMO test and Bartlett's test of sphericity first to examine the suitability of the data for factor analysis. Previous studies indicate that the KMO coefficient should be higher than .60 and the results of Bartlett's test of sphericity should be significant (39). Our results to determine the suitability of the factor analysis of the scale showed that the KMO coefficient was .90 and the Bartlett's test of sphericity was found to be significant ($p < .001$). We can say that this value is a very good value for KMO and it is appropriate to analyze the relevant data group.

Reliability, on the other hand, can be defined as having test or scale results reveal the phenomenon related to the conceptual structure correctly and having the measurement tool provide similar results also when applied in different places, at different times and with different masses selected from the same main mass (33). Although a reliability coefficient above .70, which can be considered sufficient in Likert-type scales is requested, it should get close to 1 as much as possible (33,43). In addition, it is undesirable for the reliability coefficient to be above 90. This is because this results from a high number of similar items rather than the reliability of the scale. Therefore, if the Cronbach's α value of the scale is above .90, the researcher can reduce the number of similar items in the scale and make the scale more economical. In this developed scale, the Cronbach's α value of .81 - .89 in both subscales of the scale and the overall scale indicated that the number of items in the scale was sufficient and the reliability was at a good level. This is because it is stated in the literature that a value between .80 and .90 for Cronbach's α value is a sign that the reliability of the scale is very good (33). It was showed that scale is reliable and consistency of all evaluation items of a scale.

CONCLUSION

Functional Health Patterns-Based Perceived Health Scale is a valid and reliable scale that will facilitate subjective data collection of nurses working in clinics and in field studies. The fact that the scale is the first valid and reliable scale to be used in facilitating subjective data collection of nurses in Turkey is the strongest aspect of the study but also reveals its importance.

Future research

Researchers working in the clinical field often experience disruptions in data collection processes due to the busy schedule and long questionnaires. Therefore, in the present study, the number of questions was kept to a minimum and the expressions were designed as short and clear as possible in order for both the researchers to use the form comfortably and the individuals, who will fill the form, to be able to answer the form practically. Thus, it was tried to save resources. This developed scale allows determining how the effect of the initiatives in the field of health is reflected on individuals, thus enhancing the quality of health care services even more.

Scale instruction

"The FHP-PH scale was developed to determine the subjective perceptions of health of individuals in the general population. The scale consists of 3 subscales and 26 items and can explain 50.6% of the variance for functional health patterns. Factors in the scale were not named. The factor 1 in the scale consists of 13 items (Items I1 - I13) and Cronbach's α reliability coefficient is 89. The Factor 2 in the scale consists of

6 items (Items I14 - I19) and Cronbach's α reliability coefficient is .81. Finally, Factor 3 consists of 7 items (Items I20 – I26) and the Cronbach's α reliability coefficient was determined as 84. The overall Cronbach's α reliability coefficient of the scale was calculated as .89, which indicates high reliability. In scoring the scale, items I4, I8, I14, I15, I16, I17, I18, I19, and I20 were scored in reverse. The total score to be obtained from the overall scale ranges between 26 and 130. The increase in the score indicates positive health patterns. The average response time of the form was determined as 92 seconds.

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