International Journal of Nursing Sciences 4 (2017) 303–310

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Contents lists available at ScienceDirect

International Journal of Nursing Sciences

journal homepage: http://www.elsevier.com/journals/international-journal-of-nursing-sciences/2352-0132

Original Article

Parents' and teachers' expectations of school nurse roles: A scale development study

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ARTICLE INFO

Article history:
Received 18 September 2016
Accepted 5 May 2017
Available online 6 May 2017

Keywords:
Nurse's role
School health
Nurse's role
Scale
Reliability
Validity

ABSTRACT

Objectives: Many studies concerning the roles and functions of school nurses exist, however, such studies are very limited in Turkey and there is any research on a comprehensive measuring tool that can evaluate teachers' and parents' perceptions and expectations of school nurses roles. The purpose of this study is to develop a valid and reliable assessment tool that can be used to determine parents' and teachers' expectations of school nurse's roles.
Methods: For the methodological research "Parents' and Teachers' Expectations of School Nurse's Roles" scale was designed and administered at primary and high schools in Turkey. To assess the data, assessment of item variability, internal consistency, factor analysis, correlations between the scale and subscales, and test-retest reliability were utilized.
Results: The content validity index for the scale was 0.94. As a result of core components analysis varimax rotation, 7 factors were obtained from 54 items. Cronbach's α coefficient for the factors ranged from 0.82 to 0.92. The intra-class correlation coefficient for the test-retest reliability was 0.859, $P < 0.001$.
Conclusions: The scale was a rather valid and reliable assessment tool in determining the parents' and teachers' expectations of school nurses' roles.
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1. Background

To improve the health, well-being of children and develop their health and life skills, school health services (SHS) need to be developed in the educational settings [1–3]. The school nurse (SN) as the key personnel in SHS contributes to the protection, promotion and assessment of student and school staff health [4]. Recent research shows that the role of the SN has changed significantly. The complex and versatile role of the SN involves; developing and implementing a health plan; providing ongoing information on health by offering consultancy to students, parents and school staff for helping them solve health problems and acquire behaviors that assist them in maintaining a healthy lifestyle, and also informing them on how they can benefit from SHS [5,6], promoting a healthy and safe environment for the students in order to prevent events involving violence and bullying [7]; maintaining coordination and inter-disciplinary co-operation among health professionals, students, parents, school executives, teachers and other school staff [6]; planning, implementing and monitoring of immunization services; and actively collaborating with others to build self-management, self-advocacy, and learning [7,8]. These SN roles of being a care giver, coordinator, advocate, consultant, develop and promote quality standards, policy developer and liaison [7,9–11] indicate the complexity and importance of this profession, yet all these functions support the facilitation of the educational process by improving and protecting the health status of children.

In school health nursing (SHN), efforts are made to improve worldwide standards and international nursing language. Developments that have taken place in North America have guided many European countries. According to the NASN in the USA there

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Peer review under responsibility of Chinese Nursing Association.

http://dx.doi.org/10.1016/j.ijnss.2017.05.002
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should be one SN for every 750 students [7,12]. As for Turkey, only 520 SNs are hired to serve 20 million students, which prove the shortage of funded SN positions in the SHS [13,14]. The most recent regulations of SHS and the Policy and Legislation for the Nurse in Turkey state that SHN requires high level of knowledge and expertise in SHS and special training in this field [15]. Since SNs work with diverse populations, they often face different expectations and perceptions of their roles in the workplace. Hence, these expectations may affect SNs' perceptions of their roles, which may in turn influence their actions and the outcomes of these actions.

2. Literature review

There have been many studies examining the SN's roles and functions by assessing the perceptions of the school administrators [12,16], teachers [4,17], SNs [12,16,18] and parents [3,17,19–22].

Maenpaa and Ástedt-Kurki [21] found that parents did not know about school nurses' work and school health services. In some research which investigated the perceptions of primary school parents toward SN roles, majority of the parents believed that the SN had the responsibility of providing first aid and emergency care to students and perform health screenings [3,22,23]. Plenty of research supports the idea that the most common function of SNs fulfill is their consultancy role and indicates that SNs perform direct care and first aid practices, but minimally fulfill their research roles [8,26]. A qualitative study on nurse's perceptions of their roles and responsibilities conducted by Emiroglu et al. [18] in Turkey revealed that SNs showed inadequate perceptions about their roles and all nurses were found to have an insufficient understanding of health training and consultancy roles. Also the majority of the nurses perceived that they don't need to have research roles. In the study implemented by Yu [27] important tasks for SNs were defined as following; control and prevention of common and infectious diseases, health education and counseling, dealing with routine health problems. Many studies indicated that both educators and parents perceived the primary role of the SN to be providing first aid and emergency care and dispensing medication [12,16,17,20]. Some studies implemented on the roles and functions of SNs in Turkey showed that SNs have a significant role to play in helping students improving their health and stress the importance of the SN in monitoring student growth and development, and identifying present health problems [24,25].

There is any study of a comprehensive measuring tool to evaluate teachers' and parents' perceptions and expectations of school nurse's roles in Turkey. Their views could give feedback to government, academicians and the school nurses and could shape school nurse roles and responsibilities. The purpose of this study is to develop a valid and reliable assessment tool that can be used to determine parents' and teachers' expectations of SN's roles.

The major research questions are:

- Are the items of the developed tool clear and meaningful?
- Is the reliability of scale items (internal consistency) high enough?
- How stable are the responses at two different points in times?
- How many factor loads does the scale have?

3. Materials and methods

3.1. Subjects and procedure

Population of the study were all the parents of the students studying and the teachers employed in all the primary and high schools located in İzmir. Four primary schools and four high schools in İzmir metropolitan area were chosen by simple random sampling method. In scale development studies recommended number of participants per-item is 5–10 [28]. A study sample of 624 participants in total (371 parents and 253 teachers) was found to be adequate. Teachers who had a minimum of one year employment experience and parents who volunteered to participate in the study were included. For the data collection, the teacher information forms were distributed to teachers in the school and parent information forms were taken to the parents by their children. Written consents were taken from local Ethics Committee and İzmir Provincial Directorate for National Education. The participants were informed of the research procedures and notified that the answers to the questionnaire should be anonymous. The institutions were informed on the results obtained.

3.2. Scale development

The scale was developed in four multistep phases listed in Table 1 [3,12,17,20,22].

3.2.1. Phase 1: planning

To begin development of the scale, a review of the literature was conducted and the items of scale were developed in accordance with the variety of international roles that SNs take such as; caregiver, educator, consultant, advocate, case finder, and researcher, which were discussed in the literature review and role requirements on SN in the guidelines or regulations of SNs in Turkey [15]. Interviews with teachers, parents and SNs were conducted and SNs' activities were also observed. The researchers benefitted from their own experiences as public health nurses and faculty staff practicing in the school health settings. Eventually the scale items for this study was generated. The initial scale comprised 57 items. For the response of the items likert-type format based on 5-point from 5-strongly agree to 1-strongly disagree was used. The higher scale score of the respondent indicates the higher expectation of SN roles.

3.2.2. Phase 2: Scale construction

3.2.2.1. Expert review for content validity. Eleven nursing faculty staff who have MSc and PhD degree in child health nursing and in public health nursing and also have field experiences in SHS, were invited to be experts. The researchers explained the purpose and objectives of the study to them individually and requested to review all items and give comments on item clarity and appropriateness as well as how well the item reflected the construct of expectations for school nurse roles. Davis's technique was used to evaluate the CVI. The experts were asked to rate each scale item on a four-point Likert scale ranging from not relevant (1), to very relevant (4). But experts judged four items to be confusing as a result of wording or an unclear relationship with school nurse' roles so they pointed out that they needed to be modified. After several discussions within the research group and with experts the preliminary scale with 57 items was drafted. Each item is scored on a 1-to-5 scale degree to which each statement was not at all (1), little, somewhat, important to very important (5).

3.2.2.2. Instrument testing. For the initial pilot-testing a sample of 10 teachers and 10 parents examined the preliminary scale and the wording was reviewed before launching the major scale. The major scale was completed by 371 parents and 253 teachers. The scale was completed in the allocated time about 20–30 min.

3.2.3. Phase 3: Validity-reliability of the scale and psychometric evaluation

Data were analysed with frequencies, Cronbach's α and

Table 1
Scale development procedures.

Development Phase	Scale development steps
Planning	Determining the measure purpose
	Presenting the literature review
	Conducting interviews with teachers, parents and SNs
	Observing SNs' activities
	Selecting Likert scale as item format
Construction	Creating item pool
	Making expert review of all items for content validation
	Reducing item pool, interview with expert panel
	Piloting test of the preliminary scale items (initial draft)
	Administering the scale to sample
Validity-Reliability Evaluation	Obtaining experts views for the content validity
	Estimating content validity index
	Undertaking factor analysis and principal component analysis for construct validity
	Estimating Cronbach alpha, split-half, Pearson correlation, item total item correlation and conducting test-retest method for stability the reliability

exploratory factor analysis (EFA) for reliability and validity scale [29,33]. For the content validity, CVI was calculated by considering the experts' views [29,31]. The Kolmogorov-Smirnov test was applied to test normality by comparing the data to a normal distribution with the same mean and standard deviation of sample [32]. The results showed that 95% of the reliability interval, the level of significance was considered at $P < 0.05$ [32,33].

For the factor analysis (FA), the EFA was undertaken in the study. Principal component analysis with orthogonal rotation varimax method was applied for FA. First correlation matrix among the items was obtained. Kaiser-Mayer-Olkin (KMO), measure of sampling adequacy (MSA) and Bartlett test of sphericity were applied. It was checked whether sample size is appropriate for analysis. The common variance value communalities were also checked. Anti-image correlation matrix, which is the negative of partial correlation, was examined [29,33]. After FA, standardization was applied in order to make comparison, because the number of questions belonging to each factor was different. For this reason, the raw score obtained from the FA was divided by the highest number that could be obtained from that factor, and then multiplied by 10. Points obtained after the standardization varied between 1-to-10. After the points of all sections were standardized one by one, they were added together, divided by the partition count and their arithmetic average were calculated and it was designated as average total points. The formula for the standardization of points was applied (Standardization Formula = raw score/maximum score* x 10, *Maximum score = item number in the factor x 5) [33]. Reliability of scale was measured by internal consistency and split half reliability using Cronbach's α coefficient and Pearson's correlation analysis and Hotelling's trace criteria [32]. Test-retest reliability was also measured on 31 teachers and parents to determine the instrument's stability. Pearson's correlation coefficient was used to examine the correlation between the two sets of scores. Reliability coefficients greater than 0.70 were considered acceptable [28]. The interval between the first and second tests was 3–4 weeks.

4. Results

4.1. Participants

A total of 750 teachers and parents were invited to participate in the research and a total of 624 questionnaires were returned (initial respond rate 86%).

The mean age of the teachers was 42.92 ± 8.91 (20–60 year), with a teaching experience of 20.00 ± 9.14 years (1–39 year). A few of the teachers (2.4%) had some experience in school administration as a principal. Majority of the teachers (73.1%) had children. Most of the teachers (94.5%) reported the importance of a school nurse to be employed in a school as being a part of a school's comprehensive health programme and 74.3% of the teachers expressed that SNs should have a university graduate degree and 13% stated they should possess Masters or PhD degree. The mean age of 371 parents was 40.03 ± 6.86 (18–65) and 71.2% were mothers and 25.3% were fathers. Only 40.7% of parents were graduates of university. Almost all parents (96.5%) stated that a SN should be employed in every school. Of the parents 65.4% of them stated that the SN should have a university graduate degree, 23.5% suggested that the SN should have a Masters or PhD degree.

4.2. Scale development

In the planning phase of the scale items were generated, the initial scale comprised 57 items listed in Table 2.

In the phase 2 of scale construction were evaluated for content validation of the expert reviews. In the scale all of the items had CVI over 0.80 so they all remained in the scale (r = 0.94). This finding showed that all of the items were related to the roles of SNs and that it sufficiently represented these role areas. For the initial scale pilot-testing, the data were found to be normally distributed (Z test = 1.264, $P = 0.082$).

In the phase 3 we were obtained psychometric evaluation of the scale. Factor analysis (FA) were implemented for the construct validation. The construct validity of scale was tested using a principal components FA. Initially KMO (0.959) indicated that the partial correlations among variables are not small. And Bartlett's test's result indicated that the correlation matrix is an identity matrix, which would indicate that the factor model is appropriate. ($\chi^2 = 24328.02$, DF = 1596, $P = 0.000$). So it was appropriate for factor modeling. Further, because the sample size (624 people) was 10 times more than the number of items in the scale, it was decided that appropriate for FA. The results of the FA of the scale are presented in Table 3. Those items with factor loading of less than 0.4 and cross-loading with several factors were excluded. Item 13 “Carries out the school entry medical examinations”, item 19 “Supports students about participating in sport activities” and item 56 “Improves students' ethical values” were excluded due to low factor loading.

The first item “provides individual health care to students” had the lowest factor load (0.441), and the item 29 “trains students and school staff against violence” factor load (0.883) had highest (Table 3).When evaluating communalities of scale items, it was found that each item was greater than 0.30 and that first item (0.441) showed the lowest value. The proportion of the total

Table 2
Item total statistics of POSNR scale ($n = 624$).

Items of the scale	Items mean score	Std. Deviation	item total correlation	Correlations
Item 1: Provides individual health care to the students	4.29	0.87	0.566	
Item 2: Observes and cares of students with chronic illnesses as well as carries out their treatment	4.20	0.88	0.596	0.51
Item 3: Supports and encourages students with chronic illnesses to take better care of themselves	4.42	0.68	0.635	0.65
Item 4: Provides students and school staff members with help and emergency service (such as observations and transferring patients) in emergency situations, accidents and acute conditions of illnesses	4.63	0.63	0.631	0.47
Item 5: Provides collaboration between teachers, students and parents	4.04	0.98	0.654	0.32
Item 6: Cooperates with the families	4.17	0.89	0.749	0.71
Item 7: Collaborates with health organizations	4.44	0.73	0.625	0.60
Item 8: Collaborates with the personnel who are responsible for food preservations and food processing in food inspections	4.14	0.96	0.585	0.54
Item 9: Gives first aid to the injured in necessary situations	4.73	0.58	0.614	0.33
Item 10: Takes student's health history	4.38	0.81	0.618	0.43
Item 11: Also provides health care to the school personnel	4.17	0.90	0.593	0.48
Item 12: Keeps ready-to-go kit items in a backpack or duffle bag as well as emergency supplies in the emergency cupboard ready and prepared for disaster, injury accidents and emergency situations	4.74	0.55	0.596	0.38
Item 14: Periodically carries out the physical examinations of the students	3.79	1.08	0.595	0.71
Item 15: Visits students'' homes for health monitoring if it is necessary	3.61	1.11	0.596	0.60
Item 16: Carries out students' eye and ear health checks as well as child and youth growth and development health checks	4.11	0.99	0.538	0.48
Item 17: Prepares students for medical examinations	4.15	0.91	0.563	0.49
Item 18: Carries out students' treatment (medication delivery, wound dressing) when it is necessary	4.58	0.70	0.588	0.45
Item 20: Helps students with their activities in their free time	3.22	1.24	0.712	0.64
Item 21: Determines the causes of accidents and is involved in the control of these	4.04	1.01	0.555	0.46
Item 22: Provides students with healthy conditions of heating, lighting, and adequate supply of fresh air	3.37	1.26	0.718	0.51
Item 23: Helps students be transported from school to their homes and vice versa considering their special health care needs	3.14	1.31	0.730	0.70
Item 24: Follows situations of students' absenteeism, school break and being late for school	2.51	1.27	0.653	0.63
Item 25: Identifies, protects and supports students who are at risk of child maltreatment and violence	3.49	1.22	0.689	0.52
Item 26: Takes the necessary precautions against smoking, alcohol and drug consumptions	4.05	1.05	0.566	0.57
Item 27: Supports healthy and nutritious food consumption in the school canteen	4.28	0.93	0.619	0.60
Item 28: Provides prevention of unsafe sexual behavior	3.38	1.29	0.664	0.42
Item 29: Educates students and school employees against violence	3.30	1.28	0.704	0.92
Item 30: Identifies the health issues that students need to know	4.20	0.81	0.697	0.41
Item 31: Organizes individual and group educational workshops on issues about health awareness, good habits, positive health attitudes and behaviors (nutrition, doing physical exercises, hygiene applications, smoking, and drinking and drug consumption, sexual health)	4.36	0.81	0.715	0.61
Item 32: Develops training tools and utensils for health education (brochures, booklets, leaflets), and encourages students and school staff to read and use them	4.19	0.92	0.675	0.64
Item 33: Informs the school staff about specific health needs of the students	4.12	0.92	0.719	0.55
Item 34: Trains school staff members on how to take care of their own health	4.01	0.96	0.692	0.74
Item 35: Gives parental educational healthcare workshops on how parents can take care of their children's health	3.98	1.03	0.711	0.58
Item 36: Explains and protects students' and school staff members' rights	3.00	1.30	0.669	0.43
Item 37: Conducts research on the development of school nursing services	4.06	0.88	0.655	0.39
Item 38: Applies school health nursing services considering the scientific results of the research that has been conducted	4.17	0.89	0.697	0.66
Item 39: Takes part in scientific activities to improve and develop her knowledge and skills	4.21	0.86	0.716	0.59
Item 40: Follows the recent developments related to nursing, applies them in her profession	4.36	0.77	0.736	0.72
Item 41: Determines those students or school staff members who are or are suspected to be sick	4.31	0.82	0.586	0.57
Item 42: Provides clean and safe environment at school	3.89	1.08	0.730	0.40
Item 43: Provides clean water supplies at school	3.96	1.07	0.763	0.73
Item 44: Trains students and school staff on how and why to keep the environment clean	3.99	1.06	0.747	0.67
Item 45: Takes samples of cooked food at school and sends them for examination in terms of cleanliness	3.79	1.18	0.761	0.63
Item 46: Examines food safety and hygiene in the canteen as well as promotes healthy and nutritious food	4.08	1.06	0.768	0.74
Item 47: Informs parents about the symptoms of infectious diseases	4.20	0.89	0.651	0.52
Item 48: Identifies students with infectious diseases and does not allow those to attend school until they recover completely	4.25	0.91	0.511	0.49
Item 49: Supervises and carries out the immunization at school – students are given the necessary vaccines annually	4.24	0.95	0.545	0.41
Item 50: Helps students and their families benefit from the healthcare organizations and institutions	4.12	0.96	0.657	0.50
Item 51: Provides students with psychological support	3.55	1.18	0.586	0.45
Item 52: Offers consultation appointments for students, parents and school staff members related to health issues when they need	3.71	1.14	0.624	0.60
Item 53: Organizes group meetings with teachers, students and parents	3.73	1.05	0.689	0.69
Item 54: Leads the delivery of health services at school	4.29	0.80	0.619	0.52
Item 55: Ensures the confidentiality of health information regarding the students and parents	4.27	0.85	0.624	0.59
Item 57: Supports teachers who deliver health information classes	4.21	0.82	0.584	0.35

variance of items explained by these seven factors range from 1.8% to 13.75%. (Cronbach's $\alpha = 0.857$). A widely used method of factor extraction is the principal components method. Principal components analysis (PCA) creates successive linear combinations of observed variables. The principal components method showed that scale is a multidimensional; seven-factor scale with 57 items explains 54.90% of total variance. These factors were designated with respect to the roles of the SN, “protect and improve health” (12

Table 3
Factor Variables and Factor Loadings of the scale ($n = 624$).

Factors	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
Item 23	0.658						
Item 24	0.601						
Item 22	0.647						
Item 20	0.609						
Item 15	0.579						
Item 14	0.611						
Item 21	0.504						
Item 36	0.572						
Item 28	0.869						
Item 25	0.610						
Item 29	0.883						
Item 26	0.590						
Item 10		0.550					
Item 17		0.514					
Item 1		0.441					
Item 2		0.567					
Item 3		0.561					
Item 11		0.533					
Item 9		0.598					
Item 12		0.625					
Item 18		0.541					
Item 4		0.558					
Item 30			0.578				
Item 31			0.640				
Item 32			0.581				
Item 33			0.679				
Item 34			0.672				
Item 35			0.622				
Item 47			0.593				
Item 57			0.477				
Item 46				0.682			
Item 27				0.598			
Item 45				0.668			
Item 43				0.709			
Item 44				0.661			
Item 42				0.655			
Item 37					0.611		
Item 38					0.626		
Item 39					0.654		
Item 40					0.671		
Item 41					0.545		
Item 8						0.583	
Item 7						0.594	
Item 5						0.588	
Item 6						0.683	
Item 50							0.580
Item 52							0.650
Item 51							0.535
Item 53							0.687
Item 55							0.527
Item 54							0.608
Item 48							0.462
Item 49							0.454
Item 16							0.496

items), “caring of illnesses/healthy individuals and first aid (10 items-item 1–4,9-12,17,18), training and giving health education (8 items-item 30–35,47,58), healthy school environment, research, collaboration and preventing illnesses and consultancy” (24 items-item 5–8,16,27,37–46,48-55).

It is seen on Table 5 that total factor correlations of the scale have values that vary between 0.522 and 0.790. The statistics above indicated that there is a high correlation between lower factors. This shows that features of the assessment tool affect each other. The total points of Factor 1 shows strong positive correlation ($r = 0.522$, $P < 0.001$), yet factor 3 total points shows very strong positive correlation with factor 7 ($r = 0.790$, $P < 0.001$). The lowest factor correlation is observed in factor 2 with value of 0.527 and the highest correlation is seen between factor 7 and factor 1, and between factor 7 and factor 4 with value of 0.763.

Table 2 contains item means of the scale 57 items. The mean total score for scale was found to be 216.59 ± 32.59 (54–270) and item 36 (“Explains and protects the rights of students and school staff”) had the lowest item mean score (3.00 ± 1.30) and the item 12 (“Keeps the emergency cupboard and bag prepared for emergency cases involving accidents or injuries of any kind”) had the highest mean (4.74 ± 0.55). Hotelling's trace criteria was found to be significant, $P < 0.000$, 27128.031.

For internal consistency reliability analysis, the Cronbach's α for all 54 items was 0.863, and for the items of the sub-scales was 0.82–0.91 (Table 6), and Spearman-Brown correlation coefficient was 0.927. The Guttman split-half reliability coefficient was 0.920 (0.936 for first half of the items for first 27 items), and 0.949 (for the rest of the items). It has been determined that the values of the total item correlations of the scale were ranging between 0.522 and 0.790, and there was high correlation between the lower factors, which showed that the features of the assessment tool affected each other. The stability of the measures was examined by test-retest reliability. Coefficient of the scale supported its good reliability ($r = 0.859$, $P < 0.001$).

4.3. Standardizing scores and obtaining average total scores

Cronbach's α values of the scale and sub-factors and their standardized scores are presented in Table 6. The total average score obtained from the scale was 56.84 ± 8.42. Taking into consideration the mean and standard deviation scores, the factors can be listed from highest to lowest: factor 2 with the highest score (8.85 ± 1.03), then factor 5 (8.44 ± 1.35) takes second position on the list, factor 6 is the next in the list (8.39 ± 1.44), factor 3 is the fourth with scores 8.31 ± 1.37, and then factor 7 with score values of 8.03 ± 1.36, factor 4 is in the sixth position (7.99 ± 1.74) and the lowest scores are of factor 1 (6.82 ± 1.73). The total average point obtained from the scale was 56.84 ± 8.42. It was observed that the highest point obtained in the sub-factors scale was of the factor 2 (8.85 ± 1.03).

5. Discussion

This study was performed to develop an assessment tool that can be used to determine the expectations of teachers and parents of the roles of SNs. The findings of this study provided support for

Table 4
Assessment of parents' and teachers' perceptions of school nurse's roles scale: principal components factor analysis rotation findings ($n = 624$).

Factors	Eigen values	% of variance	Cumulative variance %
Factor 1: Protect and improve health	7.837	13.750	13.750
Factor 2: Care of ill/healthy individuals and first aid	7.089	12.437	26.187
Factor 3: Training and education	6.116	10.729	39.916
Factor 4: Healthy school environment	3.956	6.940	43.856
Factor 5: Research	3.449	6.051	49.907
Factor 6: Collaboration	1.819	3.191	53.098
Factor 7: Prevent the diseases and consultancy	1.025	1.798	54.896

Table 5
Correlation results of principal component analysis ($n = 624$).

Subscale	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
Factor 1	–						
Factor 2	0.522*	–					
Factor 3	0.658*	0.630*	–				
Factor 4	0.713*	0.527*	0.721*	–			
Factor 5	0.548*	0.583*	0.709*	0.602*	–		
Factor 6	0.582*	0.715*	0.621*	0.560*	0.575*	–	
Factor 7	0.763*	0.660*	0.790*	0.763*	0.675*	0.671*	–

*$P < 0.001$.

Table 6
Cronbach's α values and standardized average points of the scale ($n = 624$).

Subscale	Cronbach's α	Mean	Standard deviation	Min– Max
Factor 1	0.915	6.81	1.73	2–10
Factor 2	0.870	8.85	1.03	2–10
Factor 3	0.897	8.31	1.37	2–10
Factor 4	0.901	7.99	1.75	2–10
Factor 5	0.859	8.44	1.35	2–10
Factor 6	0.822	8.39	1.45	2–10
Factor 7	0.857	8.02	1.37	2–10
Total Point	0.863	56.84	8.42	14–70

the reliability and validity of the scale. The most important issue in the development of a scale is the adequacy of the process, on which its reliability and validity depend. We believe that our process was sufficiently precise from the literature review stage through the final determination of scale items.

5.1. Validation methods

Content validity is defined as a degree to which the items of a scale represented the content, ensuring compatibility between the purpose of developing the tool and tool's data collection capability. In this study, CVI for each item was calculated with CVIs over 0.8 taken as indicating excellent content validity [32]. The panel members agreed that the scale reflected the school nurses' roles. All participants noted that the understandability of the scale and agreed that it was of acceptable face validity.

FA reveals the structure of a set of variables by analyzing intercorrelations among them [31,32]. In order to decide whether the scale is appropriate to the factor model, first, correlation matrix among variables was obtained and the condition was sought. Each variable in the matrix should be associated with “at least” one variable with a meaningful correlation of greater than $r = 0.40$, $P < 0.05$ [28,29]. In our study, all items except three were proven to meet this condition. When correlation coefficients are low, test items can be omitted from the scale for not being sufficiently reliable [32]. Therefore, in our study, the three items (item 13- Carries out the school entry medical examinations, item 19- Supports students about participating in sport activities, item 56- Improves students' ethical values) were omitted. When the concepts of these items were examined, parents and teachers may have thought that SNs do not hold responsibilities towards improving moral values of students, they may have thought that participating in sport activities is regulated by the Physical Education teacher and again they may have thought that the role of the school nurse is to provide care rather than treatment, which was the result of not being aware of the contemporary roles of SNs.

KMO values of 0.80 or higher are considered good, and those in the 0.70s are fair [29,32]. In this study KMO sampling adequacy for the scale was found to be good (0.959). This finding indicates that the data structure is appropriate for conducting FA. Sampling adequacy which refers to the adequacy of sampling variables is important for FA. Since in our study sample size was 10 times greater than the number of items in the scale (624 participants), Bartlett's test of sphericity test results indicated that the correlation matrix is an identity matrix, which would indicate that the factor model is appropriate.

In our study, when communalities were examined, it was observed that each article was greater than 0.30 and the lowest value was 0.441.

Due to the fact that high coefficient ratio for the data of the scale in the anti-image correlation matrix was high, it was concluded that FA could be applied to this scale. For FA principal components analysis was undertaken. To be able to apply FA in the anti-image correlation matrix, which is the negative of the partial correlation, the ratio of the high coefficients needs to be low (if they are high, the factor model is not appropriate) [29,30,32,34]. In this study, high coefficient ratio in the anti-image correlation matrix has been found to be very low so it has been decided that FA can be applied to this scale. Consequently, the number of factor was determined to be seven based on an Eigen-value of 1. 50 items of the scale were collected under factor 1. For factor rotation the varimax rotation was used [29]. The resultant factor loadings are shown in Table 3. Seven factors explained up to 54.9% of the cumulative variance (Table 4).

5.2. Reliability

When evaluating the reliability coefficient of a scale, experts suggest that the value of the most items should be above 0.70 to prove sufficiency and thus these values should be between 0.85 and 0.95 [34]. In this research, the scale Cronbach's α was 0.863 (subitems: 0.82–0.91) for all 54 items, Spearman-Brown correlation coefficient was 0.927, the Guttman split-half reliability coefficient was 0.920 (0.936 for the first 27 items and 0.949 for the rest). Coefficient alphas are all in the recommended acceptable range. These high values indicate that this scale items are homogeneous in terms of contents and they have high reliability.

Test-retest reliability was also measured to determine the scale's stability and the reliability [32]. There was a strong and linear correlations between test-retest measures ($r = 0.859$, $P < 0.001$).

Standardizing scores and obtaining average total scores

The total average of the scale was 56.84 ± 8.42. Taking into consideration the mean and standard deviation scores, factor 2 has the highest mean score (8.85 ± 1.03). This finding shows similarity with the findings encountered in some other studies in the literature review. Maughan and Adams [17] have reported that both teachers and parents perceived medication management and the first aid as the primary role of the SN. Similarly, Green and Reffel [12] in their study found out that providing basic care for ill and injured children was among the important roles of the SN. Another study that confirms similar results is Holt et al.'s [16] research. The findings of this study revealed that the task of providing first aid was one of the areas for which SNs dedicated most of their time. Gross et al. [20] reported that school nurses and school staff played an important role in SHS in aiding the health staff when providing first aid. In many studies parents stated that first aid and emergency treatment were also among the important roles of SNs [3,12,16–18,20,22,23,26].

In the research, among the factors “Research” dimension (8.44 ± 1.35) had a higher mean score in the scale too. Contrary to the findings in the existing literature [18,26], in our study, parents and teachers gave importance to the scientific aspect of the school nurse role and perceived that SHS need to be based on a scientific foundation and evidence-based nursing care.

As mentioned in the literature, if SNs should cooperate with parents, school executives and other health staff, they would contribute to the improvement of school health. Parallel to this information, the point obtained from the "collaboration" factor is high (8.39 ± 1.44) and indicates that parents and teachers regard this role as an important one. In contrast with the findings of our study, Green and Reffel [12] asserted that the cooperation role of the school nurse with children and parents was not perceived by school executives.

As in many areas of nursing, the function of "training and health education" which was observed to be high (8.31 ± 1.37) in this research has been considered to be very important because school nurses deal with a risky population. Although the existing literature concerning the role of training also supports the findings presented above [27], a study carried out in Turkey [18] revealed the opposite, that is, it was determined that trainer role was not perceived on a satisfactory level.

Mean of the factor "Preventing illnesses and consultancy" (8.03 ± 1.36) was low compared to the other factors and it indicated that parents and teachers profess the view that SN is the key personnel in health promotion and disease prevention. It's important for SNs to continue cooperating with parents and administrators to improve the health and academic outcomes of students [35]. In a study conducted by Holt et al. [16] health screenings, monitoring and immunization were considered by parents and teachers to be the nursing activities on which SNs dedicated the most time. Another study demonstrated that parents found important services for the students such as checking up annually, early detection and vaccination needed to be included in SHS [3]. In the other two studies [23] parents believed preventing illnesses was among the important nursing activities. Yu [27] also discovered that the role of "protecting from illnesses and consultancy" was important. Kirchofer et al. [23] reported that the SNs' role of "preventing illnesses" was the fourth important activity.

Mean of the factor "Healthy School Environment" (7.99 ± 1.74) was perceived to be lower compared to the other factors. However, in studies carried out with SNs' [20] and teachers' [3,20], SNs perceived of concerning the fulfillment of their function in the constitution of a healthy school surrounding.

The lowest mean was obtained from the factor "Protecting and improving health" (6.82 ± 1.73). Findings of a study conducted by Nguyen and Somrongthong [3] indicated that respondents believed SNs had responsibilities in protecting and improving student health. Holt et al. [16] in their study claimed that one of the areas the school nurse had to dedicate more time on was improving health.

5.3. Limitations

In this research samples group is limited to only the parents and teachers.

6. Conclusions

Consequently, the scale "Parents' and Teachers' expectations of School Nurse Roles" was found to be reliable and exhibited satisfactory content and construct validity The scale reflected the following seven role concept areas: care of illnesses/healthy individuals and first aid, healthy school environment, protecting and improving health, training and health education, research, collaboration, preventing illnesses and consultancy roles.

6.1. Implications for school health

The scale can be used to determine the expectations of parents, teachers and school executives of the roles of SNs in the schools. This scale will be beneficial to researchers who will perform research on SN activities in school health services. Determining the expectations of parents and teachers towards the roles of SNs may help researchers and administrators of The Ministry of Health and Ministry of Education and nursing associations to redefine SN roles and duties as well as develop standards regarding these roles. The scale can be applied to a range of populations: students and parents, school administrators and teaching staff, and parents with children who need special care in different educational settings such as schools with SNs, schools without SNs, schools with children of families with different social levels.

Appendix A. Supplementary data

Supplementary data related to this article can be found at http://dx.doi.org/10.1016/j.ijnss.2017.05.002.

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