

Academic-Service Partnership programs in nursing: Development and Psychometric Evaluation of Achieving Mutual Benefits Scale (AMBS)

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Abstract

Background: The first step for the establishment of academic-service partnership programs is identification of mutual benefits. The rate of achievement of these benefits reflects the success rate of the partnership program. This study aimed to develop an achieving mutual benefits scale in nursing academic-service partnership programs.

Method: The AMBS was developed based on an analysis of the concept of mutual benefits in nursing academic-service partnership programs by the hybrid model approach. Findings of the concept analysis study was used to produce items pool. Then, the psychometric properties of the scale were evaluated using face, content and construct validities, and internal consistency, and stability for reliability.

Results: The AMBS consists of 44 items. Exploratory factors analysis supported six factor with an explained variance of 59.06%. The Cronbach's α , and Omega coefficient of the scale respectively ranged from 0.77 to 0.93, and 0.75 to 0.9. The content validity index of 0.97, and internal consistency of 0.76 were obtained for the final scale.

Conclusions: The AMBS is a valid and reliable scale for the measurement of the mutual benefits achievement rate in nursing academic-service partnership programs in six dimensions of research synergy, managers' synergy in the student education, development of nursing services, reducing the theory-practice gap, and access to the supportive learning environment. It is necessary to consider all dimensions in organizing these programs and assessing the success rate of them.

Background

A review of nursing history illustrates that nursing education has shifted over time from a hospital-based approach to academic [1-4]. These developments have gradually led to organizational divergence between educational and clinical institutions in nursing. This divergence has resulted in the undefined mutual responsibility related to clinical nursing education, research and practice, and cross-sectional and ineffective communication in collaboration between the nursing school and teaching hospitals. The organizational divergence has raised concerns about the quality of clinical education and clinical credibility of nursing faculty [2-5]. Academic and service institutions also encounter the scarcity of resources in the field of finance, labor, and educational space, etc.[6-8].

Academic-service partnership programs could provide some opportunities to share resources between the two organizations in order to attained the mutual potential benefits. So partnership programs between nursing schools and teaching hospitals could also address many of their challenges. In particular, this type of partnership programs is one of the best ways to reduce the gap between theory and practice as a serious and the old challenge in nursing profession [1, 9-11]. In nursing, academic-service partnership program is defined as a consistent and organized collaboration based on strategic relationships between educational and clinical institutions that are established to attain their mutual benefits in the field of care,

education, and research [1, 6]. The first step for building an academic-service partnership program is to find mutual benefits of the partners [1, 12].

The mutual benefits in academic-service partnership programs are due to the broad, complex and multidimensional relationships between partner institutions [1, 4, 13]. Recognizing the mutual benefits is the basis of forming a successful partnership and ensuring its continuity [1, 14-16]. Mutual benefits can also be used as measures to evaluate the efficacy of the partnership programs. In other words, the extent of mutual benefits achievement determines the degree of success of the partnership programs [1, 17-19].

There are a lot of literature about academic-service partnership in nursing and mutual benefits [20], but no scale has been developed to measure achieving these benefits as a success criterion for partnership program. The present study aimed to design the Achieving Mutual Benefits Scale (AMBS) in academic-service partnership programs in nursing and evaluate its psychometric properties.

Methods

This is a scale development study. The AMBS was devised by (1) defining concept using hybrid model as concept analysis approach (2) item generation based on findings of concept analysis study (3) testing for reliability and validity of AMBS.

Concept refinement by Hybrid Model

According to the initial search, a comprehensive definition was not found for the concept of mutual benefits in academic-service partnership programs between clinical and academic institutions in nursing. In our study, clinical institute means teaching hospitals and academic institute means nursing schools So first concept analysis was done by using the three-phase hybrid model approach that is an authentic method to refine a concept in order to scale development and measurement of it [21, 22].

In the first theoretical phase, a comprehensive literature review was performed on documents published from January 1st 2000 through September 25th 2015. The choice of this period is due to evolutions in education, particularly in nursing and midwifery since 2000, which has led service and academic institutions to turn to partnership programs as a strategy [20, 23, 24]. Therefore, most studies in this field have been published since 2000. Literature review phase was done during 2016 so it was completed by 2015 [20]. This phase yielded to a clear and comprehensive definition of the concept based on the existing literature.

The field work phase is aimed at corroborating and refining concept by extending and integrating the analysis begun in literature review phase by emphasis on empirical aspect of the concept. This phase includes the basic steps of any qualitative research in order to explore essential nature of the concept in a special context based on practical experience of involved people [21]. In our study, the field work phase, data were collected through 18 semi-structured in-depth interviews. Inclusion criteria were having

experience in clinical or academic management or academic-service partnership programs for at least two years, and willingness to participate in the research. Characteristics of participants in field work phase are given in Table 1. For the analysis, each interview was recorded. Data collection was continued until data saturation and emergence of categories. The mean duration of the interview was almost 45 minutes. MAXQDA 10 was used for data organization.

In final phase, the findings of two previous phases were combined to redefine and provide a final definition of the concept. Based on our integrative literature review, mutual benefits include a range of mutual interests, goals, and expectations between the two partner institutions that can be achieved through shared resources and capabilities of them which cannot be achieved on their own [2, 20, 25-27]. By considering this data and also context-based experience of participants in this study, final definition for mutual benefits in partnership programs between nursing school and teaching hospitals was as follows: achievement the synergy in the training and empowerment of staff, the dynamics of nursing in science and practice, and the production and application of useful knowledge in performance. On the other words, the final goal of organizing partnership programs is the fulfillment of these benefits by sharing mutual resources of the partner institutions.

Item generation

The findings of the concept analysis study were used to generate an items pool for AMBS. The items pool was assessed and negotiated by the research team in three sessions. Overlapping or repetitive items were either deleted or combined. The research team strived to choose the clearest and most relevant items.

AMBS reliability and validity

The face validity of the AMBS was evaluated both qualitatively and quantitatively. Qualitative face validity evaluation was performed by 10 participants. They were asked to read each item loudly and explain their understanding of it. Moreover, they were asked to comment on the difficulty, relevancy, and ambiguity of the items. Items were edited and reworded based on their comments. Quantitative face validity was assessed using item impact method. For this purpose, 10 participants were asked to determine the importance of each item for measuring the achieving mutual benefits in academic-service partnership programs based on their experiences. These participants include three nurses, four nursing faculty, two clinical nursing supervisors, and one matron. Five points Likert scale was used (quite important = Score 5, to some extent important = Score 4, moderately important = Score 3, slightly important = Score 2, unimportant = Score 1). The item impact score (IIS) of each item was calculated, and a score ≥ 1.5 was considered appropriate [28-30]. Moreover, item clarity and comprehensibility were improved by striving to editing and rewording.

Fifteen experts in the areas of instrument development and nursing partnership programs were invited to assess the content validity of the AMBS qualitatively and quantitatively. For qualitative content validity assessment, the experts were asked to assess the grammar, wording, item allocation, and scaling of the scale. Quantitative content validity assessment was done by calculating the Content Validity Ratio

(CVR) and the Content Validity Index (CVI) for each item. CVR of each item was calculated by asking the fifteen experts to score the items by using a three-point scale: “essential”, “useful but not essential”, and “not essential”. According to Lawshe, when the number of experts is fourteen, items with a CVR value of 0.49 or higher are considered appropriate [31]. Afterwards, the CVI of each item was determined by using the Waltz and Bussel’s criteria [32, 33]. Accordingly, the experts were invited to determine the relevancy of the items on a four-point Likert-type scale (not relevant: 1; quite relevant: 2; relevant: 3; and completely relevant: 4). The CVI of each item was then calculated through dividing the number of experts who had considered the item as either relevant or completely relevant by their total number. Items with a CVI of less than 0.78 were removed from the scale. Finally, the mean CVI of all the items were used to calculate the scale-level CVI/Averaging Calculation Method (S-CVI/ Ave). Polit and Beck recommended that S-CVI/Ave of 0.9 or greater reflect excellent content validity [33].

Exploratory factor analysis was conducted to assess construct validity of 68-item AMBS. We used the Principal Axis Factoring with a Varimax rotation. The number of factors was established based on eigenvalues over 1.0. The internal consistency of the whole scale and subscales was evaluated using Cronbach’s Alpha and Omega coefficient. Subscales were considered acceptable as a consistent measure if Cronbach’s Alpha and Omega coefficient ≥ 0.70 . Statistical analyses were conducted with IBM SPSS Statistics 25.0 software. The minimum sample size for construct validity is multiplied 5 by the number of items in the scale. Therefore, according to 68-item AMBS, the sample size was estimated 340 [29, 34]. Study participants were recruited by the simple random sampling method. Primarily, a comprehensive list of all clinical and academic managers and some nurses in nursing school and teaching hospitals affiliated to Mashhad University of Medical Sciences, Iran, was created and then a random sample of 400 participants were asked to fill out the AMBS. Inclusion criteria were having a clinical or academic management experience or having experience in collaborative programs between nursing school and teaching hospitals for at least two years and willingness to participate in the research. Finally, 345 completely-filled scales were included in the final analysis. The characteristics of participants are given in Table 2. Researcher transferred the information into SPSS file. Missing values were substituted by the digit three, which was the median of the Likert scale. The exploratory factor analysis with Varimax rotation was performed. The Bartlett’s test of Sphericity, the Kaiser Meyer-Olkin (KMO) test, as well as the scree plot and eigenvalues were used to respectively determine the appropriateness of the factor analysis model, the sampling adequacy, and the number of factors. The minimum factor load of 0.3 was employed to maintain the items in the extracted factors.

The reliability of the AMBS was evaluated by the internal consistency and the stability assessment techniques. The result of internal consistency assessment is reported as Cronbach’s alpha and Omega coefficient [35, 36]. Stability assessment was performed by test-retest technique. Burns and Grove recommend a two-week interval for test-retest stability assessment [37]. The current study participants completed the AMBS twice with a two-week interval in between. The correlation between the test and the retest scores was evaluated by the Interclass Correlation Coefficient (ICC). ICCs of 0.8 or higher denote satisfactory stability [38].

Results

The concept of MB was defined by the hybrid model. Definition of MB in nursing academic-service partnership program, according to the results of the concept analysis study is as follows: some goals that are agreed upon by the clinical and academic partners in a partnership program and achieved by relying on mutual resources of them. These benefits include: synergy in training and empowering of nursing staff, dynamics in nursing science and practice, and the production and utilization of beneficial knowledge into practice.

Qualitative and quantitative face and content validities

The primary item pool consisted of 87 items in the three domains of MB and eight sub-domains. After frequent assessment by research team, the final item pool included 53 items. These 53 items were arranged in a scale format. All items had an impact score of more than 1.5. In content validity stage, the panel of experts recommended the combination of four items and added two more item to the scale (Table 3). Moreover, they recommended many revisions to the face of the items which were revised accordingly. One item was removed from the scale because of a low CVR of 0.49. All items had CVI (I-CVI) of more than 0.87. The scale-level CVI (S-CVI) of the whole AMBS was 0.97. According to expert panel 2 items were broken into two items for making clearer and increasing precision in measuring the concept (Table 3). Also 11 items were corrected in terms of writing style. 12 items were added to the scale to increase content validity (see Table 3 for some examples). All changed and added items were assessed in terms of face validity by 10 participants and all of them had acceptable face validity. Finally, 68 items remained in the scale. Then this version was assessed for construct validity. Figure 1 shows a summary of the scale development and psychometric evaluation.

Construct validity

Item analysis

The inter correlations among items indicated that the obtained data could be applied for explanatory factor analysis. In addition, the KMO was 0.87 and Bartlett's test was significant, indicating that factor analysis was suitable for the data.

Exploratory Factor Analysis

Factors with an eigenvalue of greater than one were extracted. The scree plot showed a six-factor structure for the scale (figure 2). The suppressed point of 0.3 was considered as the minimum factor load to keep the items in the extracted factors. A summary of the six-factor with 44 items explaining the 59.06% of the variance after Varimax rotation. Items were assigned to the factors which had the greatest factor load (Table 4). Items with total corrected correlation less than 0.3 or extraction value less than 0.5 were deleted [37, 39, 40]. So the final version of the AMBS includes 44 items in 6 dimension (Table 5). The items were scored on a five-point Likert-type scale on which one stands for "never equal to 1" and five

stands for “always equal to 5”. Accordingly, the total score of the AMBS ranges from 44 to 220; while higher scores show greater achieving mutual benefits.

Reliability

The values of Alpha and Omega for the AMBS were acceptable (Table 5). Also, the ICC between the test and retest measurements was 0.76 (P value = 0.001). These findings demonstrated the high reliability of the AMBS.

Discussion

To the best of the researchers’ knowledge, there is no scale to evaluate the achievement rate of mutual benefits in academic-service partnership programs in nursing. This study was conducted to develop and assess the psychometric properties of AMBS. The designed scale can measure the achievement rate of these benefits in six dimensions. In this study, we evaluated the validity, face, content, and construction. In addition, we employed internal consistency methods (alpha and omega-coefficient) and test-retest to assess the reliability of this scale. The results of this study showed that AMBS is a valid and reliable tool.

Synergy in research as an AMBS dimension includes extending the research skills of clinical colleagues and conducting collaborative research projects based on clinical challenges. Engelke et al. (2006) considered the academic-service research synergy as a necessity to develop shared nursing research projects. They emphasized the successful collaborative research programs as a scientific basis for evidence-based practice. They suggested an increase of collaboration of nursing faculty as the research mentors to provide guidance for novice researchers in the teaching hospital [41].

Synergy between clinical and academic managers in education of nursing students and **access to supportive learning environment** were the other dimensions of AMBS. The items of these two dimensions are concerned with the collaboration between nursing clinical and academic managers to gain access to professional competent students in a supportive learning environment. Taylor (2015) asserted that the collaborative programs between the university and teaching hospitals can facilitate the clinical learning environment for both students and clinical staff. In addition, through this collaboration, academic and clinical managers build on a collaborative curriculum for student and staff learning based on shared educational resources and cross-teaching. The clinical staff members play an important role in the education of undergraduate nursing students as a mentor, and they have an opportunity to develop their knowledge with direction of nursing instructors. In addition, clinical education of the nursing students is provided in a supportive learning environment; therefore, staff and student satisfaction, clinical competency, and safer quality care are certainly increased [42-44], which are consistent with recent two mentioned dimensions in the AMBS.

Improvement of nursing staff is another dimension of our scale. Bartz et al. (2003) noticed in-service training courses for clinical nurses in collaboration with the nursing school as an important benefit of academic-service partnership programs [45], which is in line with the fourth dimension of the AMBS. Also,

Tanner (2010) suggested that partnership program between teaching hospitals and nursing school is an effective framework for meeting health care requirements and updating nurses competencies [46].

Development of nursing services have been mentioned as other dimensions of the AMBS. Franco et al. (2015) asserted that sharing resources, expertise, knowledge, and experience through inter-organizational collaboration is ultimately an excellent opportunity to deliver broad, high-quality health services [47]. Poncelet et al. (2014) considered the development of health services at all levels of prevention as an important goal of academic-service partnership programs in nursing [48].

The last dimension of the AMBS is **reducing the theory-practice gap** which is a serious challenge in nursing. Freundl et al. (2012) stated that academic-service partnership programs as an beneficial way to achieve and develop the utilization knowledge into practice [49]. Also Heshmati Nabavi et al. (2017) suggested partnership programs between academic and service institutes as a golden strategy to bridge theory practice gap in nursing [50] which are in line with the latest dimension in the present study.

Conclusion

This study led to the development of a valid and reliable scale with six dimensions consisting of 44 items. The AMBS can assess the rate of achievement to mutual benefits in academic-service partnership in dimensions of research synergy, student training, supportive learning environment, staff improvement, service development and bridging theory-practice gap. So nursing clinical and academic managers can use this scale to evaluate partnership programs between nursing schools and teaching hospitals.

Abbreviations

CVI: Content validity index; I-CVI: Item content validity index; S-CVI: Scale content validity index; CVR: content validity ratio; AMBS: Achieving Mutual Benefits Scale; MB: Mutual Benefits

Declarations

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Availability of data and materials

All data supporting the presented findings are included in this published article.

Authors' contributions

All authors have agreed on the final version and meet at least one of the following criteria as recommended by the International Committee of Medical Journal Editors: substantial contributions to conception and design (MS, FHN), acquisition of data (MS), or analysis and interpretation of data (MS, FHN, HK, FN, HS), drafting the article or revising it critically for important intellectual content (MS, FHN, HK, FN, HS). All authors read and approved the final manuscript.

Ethics approval and consent to participate

The study was approved by Ethics Committee of Mashhad University of Medical Sciences

(No. IR.MUMS.REC.1394.254).

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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Tables

Table 1
The demographic characteristics
of the participants in field work phase.

Gender	N	%
Male	9	69.2
Female	4	30.8
Work position	N	
Nurse	1	
Head nurse	1	
Clinical Nursing Supervisor	5	
Matron	1	
Nursing faculty	5	
Mean		
Age (years)	47.3 ± 7.04	
Work experience (years)	22.3 ± 7.06	

Table 2
The demographic characteristics
of the participants in EFA.

Gender	N	%
Male	79	22.9
Female	266	77.1
Work position	N	%
Nurse	126	36.5
Head nurse	110	31.9
Clinical Nursing Supervisor	70	20.3
Matron	7	2
Nursing faculty	32	9.3
Education Degree	N	%
Bachelor	257	74.5
MS	70	20.3
Ph.D	18	5.2
	Mean	
Age (years)	40 ± 7.05	
Work experience (years)	14.9 ± 7.2	

Table 3

Some examples of removed, modified and added items in content validity assessment

Modified item	Primary item
There is an independent room for nursing instructors to rest, study, and do internet research in teaching hospitals.	There is an independent rest room for nursing instructors in teaching hospitals.
It is possible to provide evidence-based research care in clinical settings.	Nursing managers support the implementation of research based nursing care.
There is a congruence between the students' apprenticeship courses and the clinical competencies required to provide safe and high quality nursing care.	There is a congruency between the apprenticeship courses of nursing students and the clinical competencies required as nurses.
It is possible to provide evidence-based research care in clinical settings.	Nursing managers support implementation of research based nursing care.
Nursing post graduates work as a clinical manager and head nurse in the hospital.	Nursing post graduates work as a supervisor and head nurse in the hospital.
Added item	
Nursing post graduates are as member in hospital specialized committees.	
Nursing post graduates determine clinical problems to develop the topic for research projects.	
Nursing care is according to the nursing process.	
Nurses have the ability to critically and accurately evaluate research and select the strongest evidence.	
Nursing graduates are able to use care equipment.	
Removed item	
It is possible to use the abilities of experienced nurses in educating nursing students. (CVR < 0.49)	

Table 4

The items after Varimax rotation and factor loadings for the AMBS (n=345).

Factor 6	Factor 5	Factor 4	Factor 3	Factor 2	Factor 1	Items	No.	
						Clinical and educational managers, clinical nurses and instructors cooperate with each other for ...		
						0.6	Conducting workshops for the development of nurses' research skills.	1
						0.68	Determining clinical problems to develop the topic for research projects.	2
						0.78	Designing and implementing joint research projects aimed to solve clinical problems.	3
						0.68	Planning and implementing scientific conferences of nursing	4
						0.7	Reviewing research proposals actively.	5
						0.74	Applying mutual research skills to conduct research projects of nursing	6
						0.65	Leading the topics of the nursing students' theses to the clinical problems.	7
						0.74	Writing and publishing joint scientific articles.	8
						0.67	Presenting the results of joint research in the scientific conferences of nursing	9
						0.63	Reporting the results of research projects to the hospital.	10
						The partnership between clinical and academic nursing managers about the teaching of students is such that ...		
						0.33	Joint sessions are organized regularly for the planning of students' clinical education.	11
						0.42	Clinical managers participate in the planning of students' clinical education	12
						0.7	Nursing graduates are able to evaluate the clinical status of the patients properly.	13
						0.77	Nursing graduates are able to provide high quality and safe care for patients.	14
						0.68	Nursing graduates are able to provide care for patients based on the nursing process.	15
						0.66	Nursing graduates are able to use care equipment.	16
						0.79	Nursing graduates are able to manage different clinical situations.	17
						0.7	Nursing graduates are able to make decisions in different clinical situations.	18
						0.62	Nursing graduates are able to cooperate with other members of the health care team.	19
						0.61	Nursing graduates are able to communicate with the patients and their families well.	20
						0.59	Nursing graduates are able to communicate with other clinical colleagues well.	21
						Through partnership between the educational hospitals and the nursing faculty ...		
						0.74	Educational requirements of clinical nurses are periodically assessed.	22
						0.82	Retraining courses are conducted to update nurses' practical skills.	23
						0.77	Clinical protocols are updated periodically according to new scientific references.	24

0.74	Retraining courses are conducted to develop nurses' leadership and management skills.	25
0.78	Retraining courses are conducted to develop nurse' communication skills.	26
0.76	Educational evaluations are conducted for clinical nurses on the courses held.	27
	The partnership between the educational hospitals and the nursing faculty is such that graduated nurses with MSc and Ph.D degree ...	
0.55	Work experience in the hospital as clinical nurses, head nurses, and supervisors.	28
0.7	Participation in conducting retraining and in-service courses for clinical nurses.	29
0.77	Participation in planning and supervising patient education program in the hospitals.	30
0.73	Participation in the production of necessary educational content for patient education.	31
0.7	participation in health care and self-care clinics in the hospitals.	32
0.72	Participation in developing clinical protocols and guidelines.	33
0.65	Participation in the planning and implementing nursing rounds in educational hospitals.	34
	The partnership between nursing faculty and educational hospitals is such that ...	
0.55	Nursing students can apply theoretical knowledge in providing nursing care.	35
0.62	There is a congruence between the theoretical courses and needed knowledge to provide nursing care.	36
0.63	There is a congruence between the students' apprenticeship courses and the clinical competencies required to provide safe and high quality nursing care.	37
0.66	Required skills to provide safe and high quality nursing care by students are assessed practically.	38
0.73	Nursing graduates provide care of the patient based on the scientific principles.	39
0.64	Nursing care is according to the nursing process.	40
0.65	Nursing graduates provide nursing care based on approved care standards.	41
	The participation of clinical nurses and managers in teaching nursing students is such that ...	
0.6	Head nurses and nurses feel responsible for students to learn during apprenticeship courses.	42
0.6	Nursing students can gain various clinical experience in all wards of the hospital.	43
0.73	Access to students' clinical education goals is a priority for clinical colleagues.	44

Table 5
The AMBS reliability and its factors

ICC (95% CI) (n=30)	Coefficient Ω (n=345)	Cronbach's α (n=345)	Mean (SD)	Items No.	Factor	Factor No.
0.88	0.88	0.93	32.73(7.4)	10	Research synergy	1
0.81	0.85	0.89	32.03(8.4)	11	Managers' synergy in the student education	2
0.71	0.9	0.94	20.18(4.5)	6	Improvement of nursing staff	3
0.79	0.86	0.89	21.05(5.9)	7	Development of nursing services	4
0.78	0.75	0.9	26.81(7.7)	7	Reducing the theory-practice gap	5
0.77	0.81	0.77	8.05(4.7)	3	Access to the supportive learning environment	6
0.76		0.95	140.73(15.8)			Total

Figures

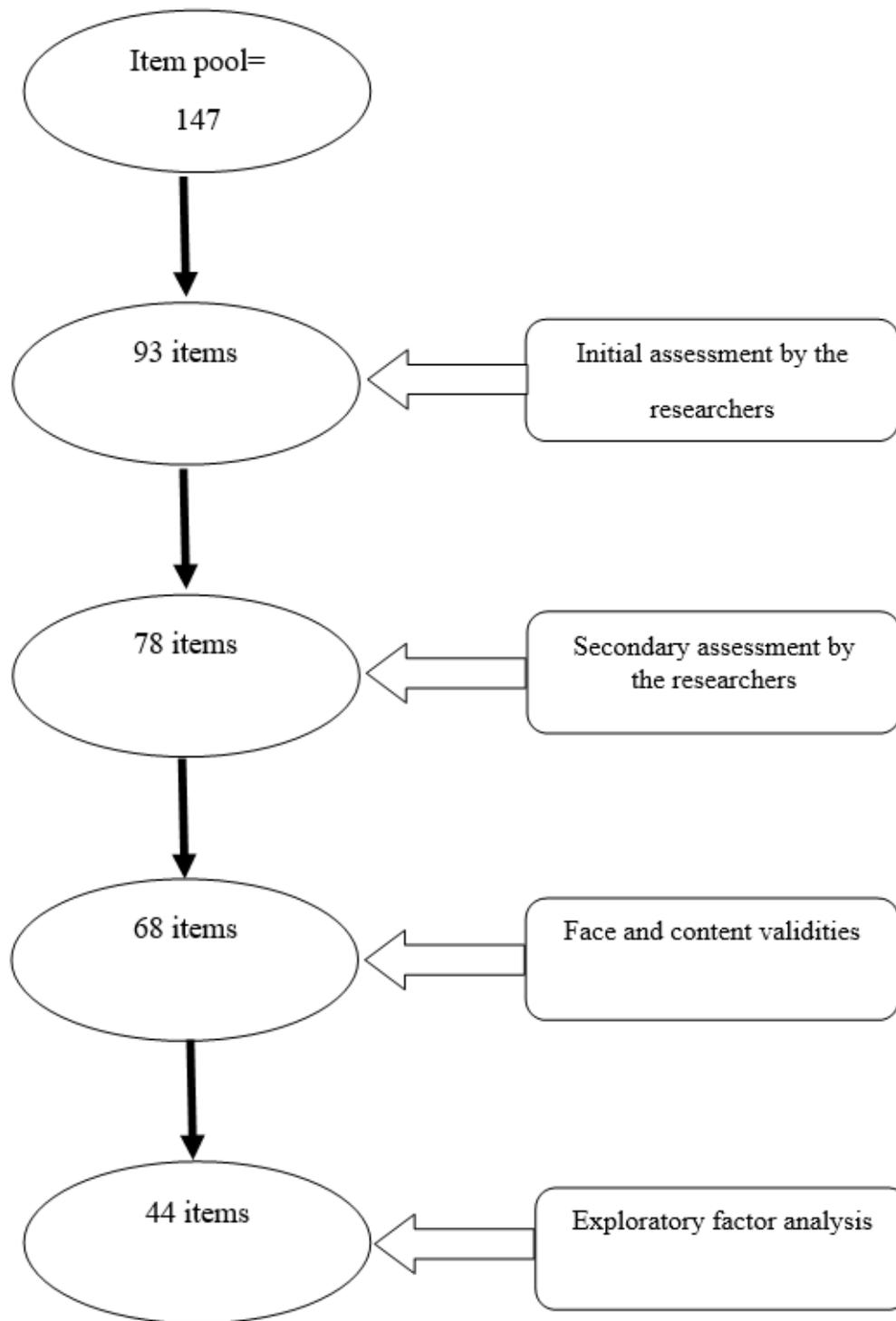


Figure 1

A summary of the scale development and psychometric evaluation.

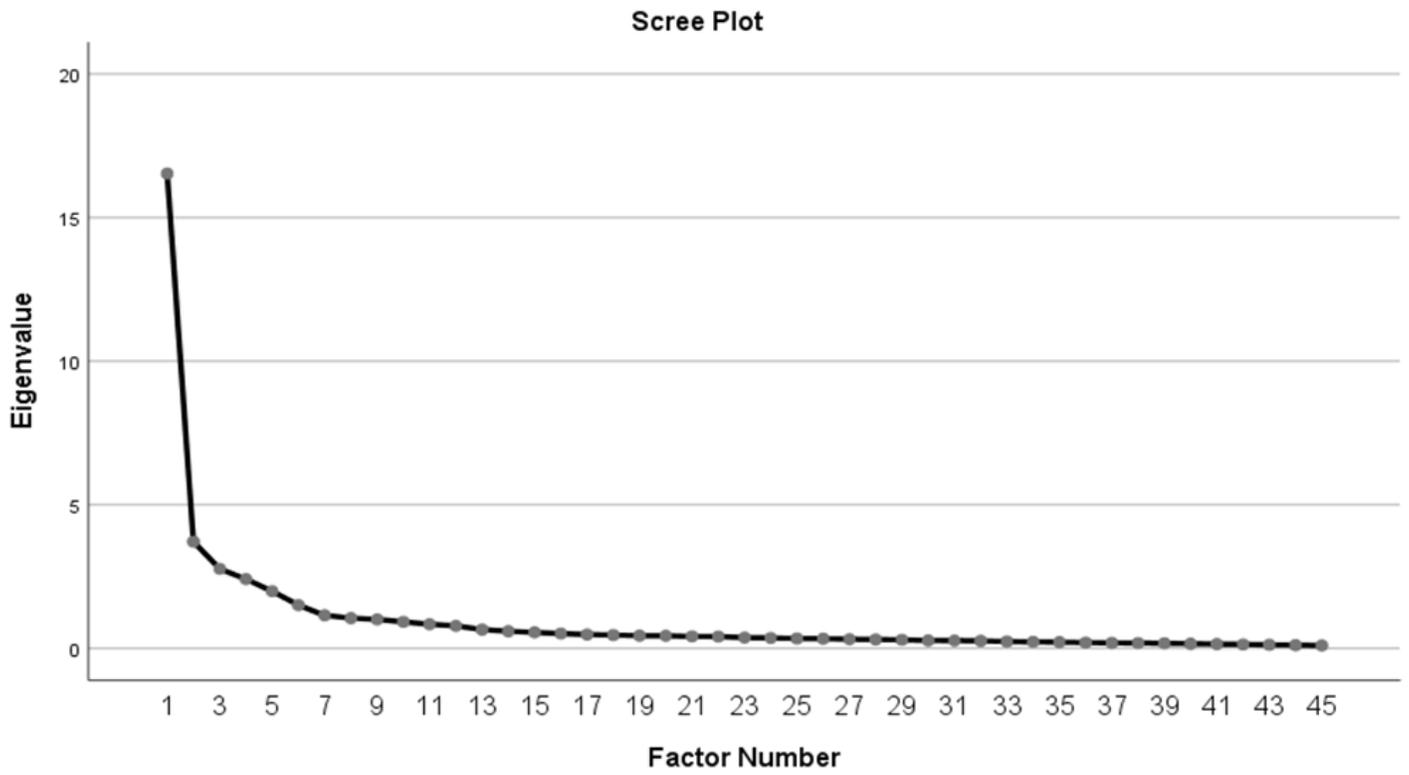


Figure 2

Scree plot.