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Development and Preliminary Validation of Health Service Measurement Scale (HSMS) for Measuring Effectiveness of Health Care Services in Universities

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ABSTRACT

The aim of this study was to develop and validate a Health Service Measurement Scale (HSMS) for measuring the effectiveness of health care services in public sector universities. For data collection, a deductive method was used. Based on review of literature, a survey questionnaire was developed and administered to 484 teachers from three public universities of Malakand division: university of Swat, university of Malakand and University of Sheringal (SBBU) upper Dir. The scale was developed based on DeVellis (2003) four phase scale development procedure. Factor Analysis technique was utilized for assessing factors which affect the health care services in universities. This study identified four important factors affecting the health care services in universities. These factor were clear communication skills, professional behavior, clinical competency and patient satisfaction. The scale may be used to enhance the effectiveness of the health care units inside the universities regarding provision of necessary treatment as per the approved protocol of health industry. The findings of this study further provide key insights to the management to review the health services and policy makers to enact effective health care policies for the universities. The limitations of the study along with recommendations are provided for future research.

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1. Introduction

Health services have undergone drastic changes in the current times due to high competition in the health industry (Moynihan et al., 2021). An enormous decline has occurred in the quality of health care medical services, health related quality of life and increasing medical costs. This situation is more alarming in the context of Pakistan where medicine costs are skyrocketing and increasing day by day. World Health Organization (2021) reports have indicated that current situation is more alarming in many countries related to health care services including Pakistan. There is a shortage of medicines and first aid tools to provide emergency help to patients. This situation was extensively observed during the last Covid-19 pandemic too which clearly exposed the poor state of preparedness of the medical facilities in general health industry and especially in the educational institutions of Pakistan. Researchers are putting high emphasis on the quality of health services to satisfy the expectations of patients. Over the last decades, increasing concerns have been shown by educators, parents and students regarding the role and practices of professional service providers throughout the country both in health industry as well as other organizations (Omer, Pan, Ali, Shukar, Fang, & Yang, 2021). It is important to evaluate the quality of health services along with the challenges or factors which play affect the quality of health care services. This study specifically deals with the development and validation of an instrument to measure the factors affecting the effectiveness of health care services which are provided in the health units of public sector universities.

2. Literature Review

Health care services have far reaching impact on the health conditions of people (Chernikova et al., 2020). The health care service sector of Pakistan is plagued with numerous care related challenges and issues. The problem is becoming more challenging due to the acute shortage of trained medical personnel and basic lifesaving drugs. Studies have revealed that patients complain about the behavior and treatment of medical professionals (Hasan, 2008). More recent research reports have shown concern regarding the status of health care arrangements provided in health units (Ghafar et al., 2020). Basic medical health care services are closely associated with professional outcomes of people in every walk of life (Du et al., 2020). Researchers have highlighted several issues related to health care services in the health industry of Pakistan. It has been found that there is increasing shortage and high costs of essential lifesaving drugs (Naz, Ghimire, & Zainab, 2021). The medical staff lacks essential humanistic values and interpersonal personal skills to deal with patients due to lack of professional skills and basic health training. The service functionaries both in formal health sector as well as general fields of life where medical services are provided to the general masses (Bhura et al., 2020). In each university, there are basic health care units. Although, health care facilities have been established in these centers but still many students and teachers are reluctant to get medical services from these basic health medical units and prefer to go to the private clinics and hospitals (Omer et al., 2021). This phenomenon has placed the medical units in almost non-functional state and has caused demotivation among not only the staff working there but also creates a financial burden on the already financially precarious conditions of educational institutions especially universities. This study aimed to develop a scale for measuring the perspectives of teachers about the issues and challenges to effective implementation of health care services in public sector universities of Pakistan. The American Medical Colleges Association has already indicated professional behaviour and empathy with patients as integral part of medical services (Oparah & Kikanme, 2006). The Pakistan medical commission also gives high regard to building of trust and positive relations between patients and medical practitioners (Shimbo et al., 2020). According to medical researchers success in health care services is associated with quality of health service and professional dealing of the health staff with the patients (Oparah & Kikanme, 2006).

2.1. Factors Affecting Health Care Services

Professional dealings of the medical professionals play a key role in the recovery process of the patients. It is suggested that the medical professionals must demonstrate good communication, create an atmosphere of trust. These measures are highly essential to be undertaken to create a better bond between patient and health practitioner which ultimately directly related to the quality of patients' well-being and its impact on the health of patient. In such relationships, patients give permission to health care professionals to supervise and manage their health and well-being. In response to this, the medical professional take the responsibility of taking care of the patients' well-being (Iliyasu, Abubakar, Abubakar, Lawan, & Gajida, 2010; White & Klinner, 2012). According to National Academies of Sciences and Medicine (2021), getting better health related outcomes and maintaining positive relationship between patient and health care professional largely depends on the degree of relationship between the health staff and the patients (El Hajj, Salem, & Mansoor, 2011; Moczygemba et al., 2010). Several issues affect the immediate recovery of patients such as willingness of the medical professional to interact with the patient, the level of satisfaction of the patients towards the health services being provided, the environment created by the doctor inside the clinic and the quality of ongoing monitor from the management and professional staff working in the health units (Chevalier & Neville, 2011). These health unit professionals may use these skills to convince the customers for improved use of medication by patients and for ensuring maximum benefits for both health care industry and patients (Diaz-Gilbert, 2005).

Research has indicated that through effective communication skills, the medical professionals can play more active role in improving patient devotion for drug therapies. They need to be familiar with the techniques and practice of effective communication. At the same time, it is also essential for medical professionals to understand effective interaction with patients and others in the medical field (Doloresco, Hoffman, & Meek, 2008; Schommer & Kucukarslan, 1997). The satisfaction of patients about the medical facilities is highly important for the improved performance of medical industry professionals. This goal can be achieved by maintaining high standard professional values like positive communication with patients and timely provision of services (Mesquita, Lyra Jr, Brito, Balisa-Rocha, Aguiar, & de Almeida Neto,

2010). Apart from verbal communication skills, effective written communication is also important for the medial professionals for resolving drug therapy related issues and adopting effective strategies to address the patients expectations and problems more efficiently through research generating research reports and disseminating it in the electronic and print media for general awareness of common masses and the governmental management system of the health care services (Mesquita et al., 2010). The importance of effective interpersonal skills and positive communication between patients and health care staff can never be underestimated. There is a need to train the health professionals how to demonstrate effective communication skills while dealing with diverse groups of patients having different nature of health complications (Hussainy, Styles, & Duncan, 2012; Long, Ingram, Pugh, Bowes, Haigh, & Moss, 2008). Highlighting the same need, researchers have further highlighted that there are numerous opportunities where the health care professionals need to demonstrate better communication and interpersonal skills such as community interaction and patient treatment in the medical health care centers (Majzub, Rais, & Jusoff, 2010; Stupans, March, & Elliot, 2009). It is the responsibility of the medical professionals to create supportive environment in the health care centers and health units so that the recovery of patients and customers could be improved and future safety could be enhanced (R. S. Beardsley, 2001).

2.2. Research Gap

Although, many studies have highlighted the views of patients, doctors and community people need and importance of health units in typical health industry (Eltorki, Abdallah, Omar, & Zolezzi, 2019), however, less attention has been paid towards the health issues and challenges in education industry (Rabbanee, Burford, & Ramaseshan, 2015; Zhang, Jin, Ngorsuraches, & Li, 2009). There is a clear need of research to highlight the health related issues and challenges in educational institutions in Pakistan (Bhura et al., 2020). Although in every university there are health care units, however, it has been observed that university communities show lack of trust on the services available in these health care units. So far, no proper comprehensive study has been card out to find out the effectiveness of services in these health care units. This study aimed to develop and validate a scale to explore the key factors affecting health care services in health care units of public sector universities of Malakand division.

2.3. Research Objectives

1. To develop and validate a scale for determining key factors affecting the effectiveness of health care services in universities of Pakistan
2. To examine perceptions of teachers about available health care services in universities.

3. Methodology

This study uses a quantitative survey research approach to collect data from university teachers about the factors affecting health care services in public sector universities of Malakand division, Khyber Pakhtunkhwa. The study was conducted in three phases. In the first phase based on literature review a scale was developed. In the second phase, factor analysis approach was used to validate the scale. In the third phase a survey was conducted to ascertain the level of satisfaction among teachers about the health care services in the universities.

3.1. Population and sample

The population of this study includes all teachers of public sector universities in Malakand division, Khyber Pakhtunkhaw. However, for data collection, a sample of 484 teachers conveniently selected from 3 universities of Malakand division: university of Swat, university of Malakand and University of Sheringal (SBBU) upper Dir as shown in Table 1.

Table 1: Demographic data of respondents

Teachers	Frequency
Gender	
Male	433
Female	51
Professional Designation	
Lecturer	246
Assistant professor	198

Associate professor	26
Professor	14
Professional Experience	
1-5 years	130
6-10 years	216
11-20 years	111
More than 20 years	27
Faculty	
Social sciences	175
Natural sciences	158
Humanities	151

Table 1 show that in terms of gender 484 teachers 433 were male and 51 females. In terms professional designation 246 were lectures, 198 assistant professors, 26 associate professors and 14 professors. In terms of professional experience 130 had 1-5 years' experience, 216 had 6 to 10 years' experience, 111 had 11 to 20 years' experience and 27 had more than 20 years' professional experience. In terms of faculty, 175 were from faculty of social science, 158 were from faculty of natural sciences and 151 were from faculty of humanities.

3.2. Reliability and Validity

To check the inter-item consistency and applicability of the scale the scale reliability was assessed using Cronbach's alpha coefficient. The results showed an alpha .79 for the scale which was acceptable in terms of suitability for data collection (Hair, Sarstedt, Ringle, & Mena, 2012). Five experts of education field were consulted for content validation of the scale. Based on their feedback, the language and nature of the items were clarified.

4. Data Analysis

The responses of the students were coded and entered into SPSS version 20. The demographic missing data were checked before the data analysis. Descriptive analysis was performed on all the items in the data. The principal component analysis (PCA) was used to explore the connection between the observed variables or items and the latent variables or factors for identifying the factor structure. Since, PCA is an exploratory rather confirmatory in nature, so it was decided to retain only factors having eigenvalues more than 1.25 (Hair et al., 2012). The factor coefficient 0.40 or greater was needed to interpret the factor structure. So, Cronbach alpha greater than 0.70 was considered as an acceptable range for reliability to the determination of internal consistency of the scale. Corrected-item total correlation was applied for identifying items which were problematic and needed to be revised and discarded. The exploratory factor analysis was utilised for identifying the underlying factors. First, Kaiser's rule with Eigen values greater than 1 was used. Second, it was ensured that each retained factor had at least three items. Third, factor loadings more than .30 was used as retaining criteria (Williams, Onsman, & Brown, 2010).

4.1. Factor analysis

Factor analysis is a widely used approach for testing psychometrics properties of a scale. This statistical procedural approach helps to scrutinize relations between observed and latent variables in a data (Shrestha, 2021). Normally factor analysis is used when researchers are not sure about the connection between the observed and the latent variables. Hence, the exploratory factor analysis approach helps by describing how and to what extent the observed variables are correlated with the latent variables. Based on the analysis, the basic theoretical factorial model or structure is identified (Goretzko, Pham, & Bühner, 2021). To explore groups of homogenous items and suitability of the items for measuring the dimensions of the scale, principal component analysis was applied. The varimox rotation method was used for factorization based on the following criteria: (a) Eigenvalues greater than 1 was used as roots criterion for selection of factors; (b) Scree test was used for examining the plot of Eigenvalues and stop factoring at the point where the plot begins to cut off and (c) to make the rotation interpretable, loadings more than 0.50 was used as a threshold point and those items were retained which were above this (Hair et al., 2012).

4.2. Scale development

A thorough review of literature was carried out to review the existing literature to develop the scale items. The researcher used the 5-step scale development procedure of

Robert and DeVellis (2003) for development the Health Service Measurement Scale (HSMS) in the context of higher education of Pakistan to measure teachers' perspectives about the factors affecting the effectiveness of health care services in the universities. The scale was developed through the following phases:

4.2.1. Step 1: Generate items

Literature was reviewed related to health care services. Due to shortage of literature on the health care services in the context of education sector of Pakistan, the literature was limited to the research studies in the context of general health industry. Based on the literature review an18 items scale was prepared.

4.2.2. Step 2: Decide format

The researchers adopted Likert scale five-point response format ranging from strongly agree =5 to strongly disagree =1. The Likert scale format provides the respondents enough space to share their choice of response as compared to checklist which is limited in giving option to share response choice. Moreover, Likert scale format are vastly used in the social science research including education.

4.2.3. Step 3: Review items

In this phase, the survey instrument was shown to subject experts in the field of education. For this purpose, four professors of education were requested to review the survey scale for content and face validation. Based on their feedback, the items were refined. Upon suggestions of the experts, 5 items were deleted from the scale and finally 18 items scale was approved by the experts.

4.2.4. Step 4: Validation

At this stage, the researchers put the scale to validation and exploratory factor analysis technique was adopted to assess the factorial structure of the newly constructed scale. The factor analysis method was used to explore the hidden dimensions based on eigenvalues.

4.3. Scale Validation

Before distribution of the questionnaire, descriptive statistics were calculated. The Skewness and Kurtosis values were also confirmed for further treatment (Norman, 2010). The EFA process was applied for initial validation of the scale.

5. Results

This section provide complete detail of the results of data analysis. The data was analyzed based on exploratory factor analysis, mean and standard deviation. The factor analysis was used to identify the factor structure of the scale and initial validation. The descriptive statistics such as mean and standard deviation was used to ascertain the perceptions of respondents about the effectiveness of the health care services in the universities.

Table 2: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.872
Bartlett's Test of Sphericity	Approx. Chi-Square	1629.546
	df	153
	Sig.	.000

Table 2 indicates the KMO having (.872) and Bartlett's Test of Sphericity was found to be significant at .000 providing an evidence for sample adequacy for factor analysis.

Table 2: Communalities for Extraction of Health Service Measurement Scale (HSMS)

	Initial	Extraction
The staff has updated knowledge about health complications.	1.000	.792
The clinical staff explains the medical problem clearly	1.000	.775
The history of patient is kept private	1.000	.783
The patients are treated more professionally in the health care center.	1.000	.643
The staff uses comforting words during checkup.	1.000	.623
The patients receive positive gestures from the staff.	1.000	.897
The patients demonstrate trust on the medication	1.000	.634

The prescribed medicines for patients are based on proper tests.	1.000	.707
The staff conducts the medical check-up in a more relax manner.	1.000	.793
The staff does not know how to treat serious patients' cases	1.000	.718
A positive relationship is maintained by the professional staff	1.000	.333
The clinical staff demonstrate utmost professional attitude.	1.000	.590
The health center has a welcoming environment	1.000	.451
The clinical staff does not discriminate among the patients.	1.000	.566
Patients are advised for follow up visits after treatment	1.000	.696
The patients have high trust on the clinical staff.	1.000	.648
The staff are caring and kind to the patients	1.000	.711
The patients are satisfied with services of the health care center	1.000	.495

Extraction Method: Principal Component Analysis

Table 3 shows that communalities of all the variables which are expressed in percentage of each of variable's variance explained by the extracted factors. The principal component analysis was used as a technique for extracting the underlying components.

Table 4: Variance Distribution in the Health Service Measurement Scale (HSMS)

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.524	41.803	41.803	7.524	41.803	41.803	6.638	36.879	36.879
2	1.879	10.438	52.240	1.879	10.438	52.240	2.188	12.157	49.036
3	1.355	7.528	59.769	1.355	7.528	59.769	1.595	8.860	57.896
4	1.096	6.089	65.857	1.096	6.089	65.857	1.433	7.961	65.857
5	.922	5.120	70.977						
6	.796	4.422	75.399						
7	.755	4.196	79.595						
8	.654	3.633	83.228						
9	.582	3.234	86.462						
10	.464	2.577	89.039						
11	.437	2.426	91.465						
12	.378	2.102	93.567						
13	.292	1.625	95.192						
14	.253	1.403	96.595						
15	.230	1.281	97.875						
16	.161	.895	98.770						
17	.141	.786	99.556						
18	.080	.444	100.000						

Extraction Method: Principal Component Analysis.

Table 4 shows the results for the application of the PCA method which produced a four-factor model that collectively accounted for 65.857 percent of the total variance in the scale. The first factor accounted for 41.803 percent of the total variance and is denoted by *'clear communication'*. The factor is explained by 6 items 1-6 in the scale and was the top strongest influencing factor. The second factor was labeled as "*professional competency"* which accounted for 10.438 percent of the total variance being the second strongest influencing factor. This factor consisted of 4 items from 7-10. The third factor was labelled as "*professional behaviour*" which accounted for 7.528 percent of the total variance being the third strongest influencing factor. This factor consisted of 4 items from 11.14. The last factor named "*patient satisfaction*" which accounted for 6.089 percent of the total variance. This factor consisted of 4 items from 15-18 being the fourth important factor affecting the effectiveness of health care services in universities.

Table 5: Rotated Component Matrix of Health Service Measurement Scale (HSMS)

S.No	Components			
	Clear communication	Clinical competency	Professional behavior	Patient satisfaction
1	.859			
2	.750			
3	.863			
4	.614			
5	.718			
6	.809			
7		.756		
8		.634		
9		.864		
10		.845		
11			.699	

12	.502	
13	.528	
14	.579	
15		.777
16		.829
17		.525
18		.582

Extraction Method: Principal Component Analysis.

Table 5 shows the result of rotation method for each of the items in the scale. For enhancing the interpretability, we rotated the most used method 'varimox rotation'. The rotated component matrix contains the coefficients or factor loadings for each of the variable in the scale. The factor loading for Clear Communication ranges from (.614 to 8.59) followed by professional competency (.756 to .864), professional behavior (.502 to .699) and patient satisfaction (.525 to .777).

Table 6: Summary of the Factor Analysis of Health Service Measurement Scale (HSMS)

Factors	Items	Factor loadings	Corrected item total correlation	Cronbach's alpha if item deleted
	1	.859	.637	.720
Clear communication	2	.750	.417	.723
	3	.863	.628	.724
	4	.614	.508	.771
	5	.718	.586	.709
	6	.809	.691	.705
	7	.756	.613	.731
Clinical competency	8	.634	.436	.780
	9	.864	.634	.727
	10	.845	.551	.738
	11	.699	.476	.749
Professional behavior	12	.502	.589	.759
	13	.528	.434	.760
	14	.579	.438	.755
	15	.777	.508	.789
Patient satisfaction	16	.829	.501	.783
	17	.525	.636	.727
	18	.582	.499	.797

Table 6 presents the summary of the factor analysis including all factors such as clear communication, clinical staff competency, professional behaviour and patient satisfaction. The tables show that all the four factors have high factor loadings. There is also strong correlation among all variables and factors in the scale which gives strong evidence for the reliability and validity of the scale.

Table 7: Summary of Satisfaction Level about the Health Service Measurement Scale (HSMS)

Statements	Mean	SD
The staff has updated knowledge about health complications.	3.04	1.876
The clinical staff explains the medical problem clearly	4.73	1.974
The history of patient is kept private	4.52	1.831
The patients are treated more professionally in the health care center.	4.55	1.732
The staff uses comforting words during checkup.	3.33	1.312
The patients receive positive gestures from the staff.	3.22	.985
The patients demonstrate trust on the medication	3.13	1.842
The prescribed medicines for patients are based on proper tests.	3.43	1.242
The staff conducts the medical check-up in a more relax manner.	4.12	1.025
The staff does not know how to treat serious patients' cases	3.26	.913
A positive relationship is maintained by the professional staff	4.40	1.317
The clinical staff demonstrate utmost professional attitude.	3.24	1.137
The health center has a welcoming environment	4.25	.931
The clinical staff does not discriminate among the patients.	4.20	1.446
Patients are advised for follow up visits after treatment	4.26	1.239

The patients have high trust on the clinical staff.	4.29	1.953
The staff are caring and kind to the patients	3.95	.841
The patients are satisfied with services of the health care center	4.29	.958

Table 7 indicated that the high mean values for all the items in the scale were above the midpoint 3.00 indicating or giving that the respondents strongly agree with all the statements regarding the effectiveness of health unit conditions of universities

6. Discussion

The major purpose of this study was to develop and validate an instrument to determine key factors affecting the effectiveness of health care services in public sector universities of Malakand division. The validation of the instrument was carried using exploratory factor analysis. The PCA method produced a four-factor structure for the 18-item measure consisting of (1) clear communication, (2) clinical competency (3) professional behaviour and (4) patient satisfaction as essential factors influencing the quality of health care services. Before factor analysis, the scale was subjected to key validation processes such as item analysis, pilot testing, data screening or normality check. The actual scale validation was performed through exploratory factor analysis and reliability and validity tests (Hinkin, 1995). This study provided strong evidences related to reliability and validity of the scale. The scale can be used to measure the situation of health conditions of health units in universities or elsewhere. Previous research has revealed that patients show better signs of recovery where they feel respected and cared unlike those where the attitude of medical care professionals remain indifferent to the needs of the customers (Hyvärinen, Tanskanen, Katajavuori, & Isotalus, 2012). In another study it was found that professionally sound health care is characterized by clear communication and highly respectful dealings with the patients (McDonough & Bennett, 2006). Moreover, researchers have indicated that demonstrating professional behavior by the medical practitioners and professionals adds to its reputation in the community and people develop stronger trust on the services of hospitals where patients are treated with care and safety (R. Beardsley, 2019). The higher factors loadings for all the 6 items for clear communication in the scale confirmed that patients strongly believed that clinical staff had strong and positive communication skills which they demonstrated during the medical checkup time. Previous research studies from other contexts revealed that patients feel safer and more satisfied when they find quality services and professionalism on the part of pharmacists in the medical field (Ghafar et al., 2020).

This study discovered that clinical competency of the health staff influenced the effectiveness of health care services. This factor is also reported by previous studies. For example, Al-Doghaither and Saeed (2000) have highlighted that the speedy recovery of patients clearly depends on the knowledge and skills of the medical practitioners who treat patients in hospitals. Another study reported that the hospital reputation in the medical field is based on updated information and know-how of the doctors and other para medical staff working in the health institutions (Mesquita et al., 2010). This study demonstrated that professional behaviour of the health care staff was an important factor affecting the quality of health care services in the universities. Previous researchers have indicated that the dealing attitude of medical staff has a great impact upon the health conditions of patients (Al-Eisa, Al-Mutar, Radwan, Al-Terkit, & Al-Eisa, 2005; Jankelová, Joniaková, Blštáková, Skorková, & Procházková, 2021). In another study it was found that patients would prefer those hospitals where the medical staff show respect to patients. In many hospitals, patients become uneasy and feel stressed due to the unsupportive and unprofessional behaviour of the medical staff (Malewski, Ream, & Gaither, 2015). Another important finding of this current study was patients satisfaction on the health care servcies in the university context. This finding is in line with results of earlier research studies. In same study it was further stated patients trust and satisfcation was a key factor in their speedy revovery (Malewski, Ream, & Gaither, 2015). It was found that timely provision of health care services, doctors' behaviour, medical equippments and avaliability of life saving drugs on reasonable prices were the major factors that determined the satisfcation level of patients (Wirth, Tabone, Azzopardi, Gauci, Zarb-Adami, & Serracino-Inglott, 2010).

7. Conclusion

Based on the results of this study, it is concluded that the newly constructed 18 items HSMS is a valid and reliable scale with sound psychometrics. It may be applied for measuring

effectiveness of the performance of health units in universities and elsewhere where health services are provide. Health care is a challenging area and has numerous dimensions. The effectiveness of health services depends on many factors. However, based on the results of this study it is concluded that there is a need to demonstrate high level of professional communication on the part of the health care professionals. Clear communication with patients during the interaction in the clinical area is an important factor that determines the success of health services in producing effective results. This study concludes that there is also a need to focus on the competency of clinical staff regarding treatment of patients in the health centers. The health staff may improve their competencies through acquiring new knowledge and skills of medical field. Another essential element of effective health service is professional behaviour of staff working in the health units with patients during the interaction in the clinic or health care center. It may be argued that the ultimate effectiveness of medical services largely depends on professional competency of the health unit professionals. Alongside, it is concluded that there should be proper efforts made on the part of the health care team for the satisfaction of patients. This may be achieved by providing utmost respect, care and support to the patients during the medical checkup.

7.1. Future Implications

Health care services are strong predictors of essential health outcomes which directly and indirectly impacts the educational performance of students. There was no reliable and valid scale for measuring the key factors or strategies for effective implementation of health care services in Pakistani universities. This study contributed to this gap in the existing literature by developing an instrument for measuring the factors to effective implementation of health services in public sector universities of Pakistan. The scale may be used for measuring the views of university management, teachers, students and other communities about health care services available to them in university. This newly developed measure may help the administration and management of the universities to revisit their policies about the provision of health care services in the campus and thus lead to improvement in the overall nature and quality of performance of health professionals working in the health units of universities which may benefits the university staff, students and others. For further validation of this scale, it is suggested that the newly developed four factor model may be retested in another context. Furthermore, researchers from different fields may benefit from this scale by using it as a measuring tool to collect data about the effectiveness or quality of health care services provided in the numerous organizational contexts.

7.2. Limitations of the Study

For the validation of this current scale, only exploratory factor analysis was adopted. As an analysis technique, EFA has some limitations. Hence, to overcome these limitations and further validation of the scale, researchers may use confirmatory factor analysis. This will provide evidence to get more robust evidence about the reliably and validity of the scale. This study examined only the perceptions of university teachers. Students are an important stakeholders of educational institutions who are always present in the campus. There is a need to explore the perspectives of students about the effectiveness of health services. This will provide further robust evidence about the extinctive usability of the scale in other fields including health industry. The 4-factor model scale may also be used in other contexts for further validation.

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