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Development and Validation of Psychosocial Scale for Students with Visual Impairment

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Abstract

The present study aims to assess psychosocial problems in visually impaired individuals by developing a psychometric scale. In the first phase of scale development, a 41-item pool was generated by 35 visually impaired individuals that depicted the types of psychosocial problems they experienced. In the second phase, 10 experts validated this pool of items converting it to a rating scale rendered in Braille (Urdu). After a pilot study to establish clarity of the items, the final phase of the study sampled 559(Men 61% and Women 39%) students who were either congenitally (76%) visually impaired or had acquired the condition (24%). The age of the participants ranged from 16-28 (*M* = 20.34, *SD* = 3.48) years, and were presented the Psychosocial Problem Scale for Visually Impaired (PSP-VI), Multi-Dimensional Scale of Perceived Social Support (MSPSS) and a demographic form. A three-factor model was extracted for PSP-VI through exploratory factor analysis comprising, *Opportunities in Daily Living, Social Discrimination* and *Self-Concept*, and a confirmatory factor analysis confirmed the model with moderate fit indices. The PSP-VI had satisfactory reliability and validity. The use of scale is for research and clinical insights for visually impaired individuals in Pakistan.

Keywords: Psychosocial problems, visual impairment, students, culture, special education

Visual sense processes 83% of information compared to the other senses (Rosenblum, 2010) and when compromised affects physical, psychosocial and mental lives of the visually impaired individuals (Gundogan et al., 2015). Visual impairment (VI) for far-vision is classified as *mild* (worse than 6/12), *moderate* (worse than 6/18), *severe*(worse than 6/60)and *Blind* (worse than 3/60) determined by the International Classification of Diseases (ICD-11, 2018). In addition, near vision impairment is defined as worse than N6 or M.08, with correction (WHO,2018). Leading causes of VI include uncorrected refractive errors, cataract, macular degeneration related to age-related and diabetes (Bourne et al., 2017; Gundogan et al., 2015; Stevens et al., 2013; Whitson et al.,2014). In adults, a higher percentage of VI is caused by cataract, whereas congenital cataract is more prevalent in children with more women (57% to 66%) suffering from VI than men (Stevens et al., 2013; WHO,2018). Acquired blindness is found to be associated with greater psychosocial and emotional disabilities compared to congenital impairments (Schinazi, 2007).

Gundogan et al. (2015) suggest psychosocial issues in the VI range from financial liabilities, difficulties in self-care, dependability on others, falls, physical injures, lack of mobility, poor quality of life, lack of social support, unemployment, and general health(Gilbert etal.,2008;Haymeset al.,2002; Welp et al., 2016;Whitsonet al.,2014). Psychosocial problems can be best understood in the light of the bio psycho social model, which explains the complex interplay between genetic vulnerability, psychological factors and social relations (Engel, 1980) that is why emotional and mental health of visually impaired individuals worsen (Bhuvaneswari et al., 2016; Ishtiaq et al., 2016) leading to secondary disabilities that include poor health, lower education facilities, psychological loneliness, higher rate of poverty and reduced economic participation. Such disabilities increase the risk of psychosocial problems in a vicious cycle that adds to the disability of a person with VI (Guo et al., 2017).

In persons with Visual Impairment (PVI) , various social and mental health problems may be found which include emotional disturbances, social isolation, loneliness, poor interpersonal relationship and less opportunity to learn social skills, small social networks, and lower participation in social interactions (Garaigordobil&Bernarás,2009; Hadidi & Al Khateeb, 2013; Kempen et al.,2012; Williams &Galliher,2006). Still other studies suggest that individuals with VI have low self-concept, inferiority feelings, lack of social acceptance and uncertain beliefs about physical appearance and body image (Gronmo & Augestad, 2000). Literature also reveals gender differences, where women with VI experience more depressive and anxiety symptoms than men (Pinquart & Pfeiffer, 2012). From the above review of literature it is evident that if these issues are not effectively resolved, they may lead to serious psychopathology including depression, anxiety, psychosomatic disorders, delinquency, truancy or drug abuse or even suicide(Huurre et al., 2001; Malhotra et al., 2018). Review of literature suggested the need to capture the voice of young people with disabilities like VI especially in educational settings and emphasized to look at the psychosocial challenges from their unique perspective (Whitburn, 2014; Grima-Farrell et al., 2011).Therefore, it is important to identify these problems with culturally-appropriate and sensitive measures.

Psychosocial consequences of Vision related disabilities hurt individuals, families and societies and in many Western societies, these concerns have been addressed by facilitating disabled people with their psychological well-being making them a productive part of mainstream society. Unfortunately, in Pakistan lack of healthcare facilities and lack of awareness (Gilbertet al., 2008), has neglected this area, and only meager efforts have been made in educational, economic, social and psychological welfare of these individuals. By identifying psychosocial problems of visually impaired individuals, especially students, we hope our society will

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take steps in the right direction to improve the ‘world’ of these disabled individuals and educate masses about their predicaments. The current study therefore aims to explore the patterns of psychosocial problems by developing a scale that would quantify these problems in the students with visual impairment, offering data to policy makers in assisting this segment of population in our society.

Method

Participants and Procedure

After getting informed consent and establishing a rapport, each participant was individually interviewed with one standard question i.e.; *As a person with visual impairment what are the various complaints or problems that you face in your life events, daily life functioning and environment?* Probing questions were asked to clarify the ambiguous and vague answers to bring them to relate simple and clear responses. Interviews were stopped when no new information was obtained. Verbatim reports were recorded and written scripts were prepared for analysis, which revealed 48 problems; and after careful sifting for repetitions, ambiguous statements, slangs etc. a list of 41 items was finalized.

In phase 2, the content and face validity of the 41 items were established by five students and five teachers who were visually impaired (experts) to offer approval (or denial) of problems listed in these items (Patrick, 2011). To clarify what psychosocial problems meant, the experts were provided with the definition of the concept as, “*the wide ranging or global complaints faced by a person with visual impairment that affect his/her life events, daily life functioning and environment”.* The experts were asked to evaluate each item, as *essential* (1), *useful but not essential* (2), or *not necessary* (3) for a person with VI. All items were either categorized as 1 or 2, and no item was considered not necessary. The initial draft of the scale therefore contained 41 items, which was presented to three language experts, who revised it for any leading information, loaded, double barreled, and double negative statements. A 4-point Likert-type scale was added to each items with 0(*not at all true*), 1 (*slightly true*), 2 (*moderately true*), and 3 (*very much true*) and a preliminary Psychosocial Problem Scale for the Visually Impaired (PSP-VI) was established.

In phase 3, PSP-VI was transcribed into Urdu Braille (Braille Printing Press, Special Education Department, Lahore) and was proofread by two blind female employees of the Special Education Department, Punjab. The proof readers read the Braille version and the researcher checked the accuracy from the printed version of the scale. No discrepancy was found between the printed and Braille versions.

Phase 4, the pilot phase, determined reading friendliness and comprehension of the scale. A purposive sample of visually impaired ten men and ten women from matric and intermediate classes were selected to go through both versions of the scale i.e., in Braille and orally. Ten (Men = 5, Women = 5) participants read the first 20 items in Braille followed by listening to the last 21 items through oral presentation. The other ten participants (Men = 5, Women = 5)were presented with 20 items orally, followed by 21items in Braille to counterbalance the version effect. The presented with Braille and a written version of the scale. They were also given the choice to read the research protocol themselves using Braille or have a reader read the material orally. They were asked to give their response verbally (0 to 3)or by indicating through a show of fingers, circling a zero with the index finger and thumb. All participants completed the Demographic Sheet, PSP-VI, and MSPSS and testing time to complete each protocol was about 80 minutes. Data from two participants was discarded for incompleteness.

A phenomenological, open-ended interview technique was used to gather the items for the scale, and a purposive sample of young (age range 18 to 26 (*M*=21.59, *SD*=2.85) year) 20 men and 15 women with visual impairment were selected. The participants were the students of matric (N=10), intermediate (N=10) graduation (N=10) and post-graduate(N=5) levels, studying in government special education and inclusive education institutions of Lahore.

participants were asked, which mode they preferred, and only 2 in 20 opted for Braille over oral presentation.

In phase 5, psychometric properties of the PSP-VI were established with a purposive sample of young (age range 16-28 (*M* =20.34, *SD*=3.48) years) 342 men and 217 women who were visually impaired and were students studying at special and inclusive education institutions (schools, colleges universities). Seventy-six percent (76%) of them were congenitally visually impaired and the other 24% had acquired VI.

Instruments

Demographic Form. Demographic form asked for basic information pertaining to the age, gender, educational level, type, and level of VI of the participants.

Psychosocial Problems Scale for the Visually Impaired (PSP-VI): The newly developed PSP-VI was used for measuring the psychosocial problems of the individuals with VI. The scale comprised 41 items that represented psychosocial problems as experienced and expressed by visually impaired individuals. Participants were instructed to “*rate each item to the extent it stands true for you”*. The scoring options included: 0 (*not at all true*), 1 (*slightly true*), 2 (*moderately true*), and 3 (*very much true*).High score on this scale reflected more psychosocial problems.

Multidimensional Scale of Perceived Social Support (MSPSS): A 12-item self-report measure developed by Zimet et al. (1988) was used to establish the construct validity of PSP-IV. The scale measures familial, friends and others perceived social support on a 7-point Likert-type rating scale, from *Very Strongly Disagree* (1) to *Very Strongly Agree* (7). Total possible scores ranged from 12-84 with high scores means high level of perceived social support. Internal consistency of MSPSS from the current study was moderately high ($\alpha = .76$).

The current research project was approved by the Institutional Ethical Review Committee, Institute of Clinical Psychology, University of Management and Technology, Lahore. Initially, brief aims and objectives of the study were sent to the authorities of the three general educational and six special education institutions of Lahore, Rawalpindi, and Islamabad. After obtaining consent from institutions, participants were approached individually and who agreed to participate was assured about the confidentiality, privacy, and anonymity of their data. They were also given the right to withdraw from participation any time before, during or after the study. All the participants were

Data Analysis

Factor Analysis was used to identify likely factor structure of PSP-VI. By splitting the sample , Exploratory Factor Analysis (EFA) was carried on the first half of the participants (*n*=279) to find out the uni-dimensionality of scale using Principal Component Analysis (PCA) with Varimax rotation, Eigen values and value of item-total correlation (Anderson & Gerbing, 1988). Confirmatory Factor Analysis (CFA) was carried out on AMOS on the second half of the sample (*n*=280). Divergent validity was established by correlating the scores of PSP-VI with MSPSS and Cronbach alpha, composite reliability (CR) and average variance extracted (AVE) were computed to establish reliability and convergent validity of the scale (Fornell-Larcker, 1981).

Results

Kaiser-Meyer-Olkin measure of sampling adequacy was .90, and Bartlett's Test of Sphericity was also significant ($p < .001$) indicating that current data is suitable for factor analysis(Field,2013); EFA was then carried out with Varimax rotation on a data set comprising of 279 participants to explore the key dimensions of PSP-VI and number of factors was determined on the basis of Eigen value greater than 1, and factor loading greater than .40 on that particular factor(Kaiser, 1974; Tabachnik & Fidell, 2013). Factor analysis was also conducted for four, three and two factor solutions. The three-factor solution was found to be the best as it has minimum dubious items and most interpretable factor structure. Nine items were excluded because they had factor loadings less than .40. The factor loadings of remaining 32 items given in Table 1, lumped under three key factors which were named as: *Opportunities in Daily Living*

Table 1

Factor Loading for PSP-VI

No	Item	F1	IT	Item	F2	IT	Item	F3	IT
1	29	**.74**	.42	2	**.77**	.44	6	**.66**	.44
2	33	**.65**	.52	3	**.74**	.52	4	**.64**	.55
3	34	**.63**	.42	39	**.60**	.18	12	**.61**	.42
4	32	**.60**	.55	24	**.57**	.64	16	**.54**	.39
5	31	**.58**	.45	37	**.56**	.45	13	**.52**	.42
6	28	**.57**	.33	9	**.54**	.63	30	**.51**	.35
7	35	**.55**	.46	7	**.50**	.52	41	**.47**	.37
8	19	**.55**	.61	38	**.46**	.49	36	**.44**	.50
9	18	**.48**	.60	40	**.45**	.39	1	**.44**	.31
10	23	**.47**	.46	11	**.42**	.43	27	**.42**	.46
11	20	**.43**	.44	22	**.42**	.44			
	Eigen Value	8.51			2.37			1.63	
	Variance (%)	27.43			7.57			5.25	

Note. F1 = Opportunities in Daily Living, F2 = Social Discrimination, F3 = Self-Concept, IT = Corrected Item-Total Correlation

The first factor (F1) *Opportunities in Daily Living* consisted of 11 items denoted to the lack of facilities in daily living, which included lack of educational opportunities and facilities, lack of recreational facilities, lack of acknowledgement from the general population, limited education institution to cater needs of visually impaired. The second factor (F2) *Social Discrimination* comprised of 11 items and denoted to a sense of social rejection and discrimination that included name calling, other people considering us a burden, lack of understanding by other people, people avoiding to interact. The last factor (F3)*Self Concept* comprised 10 items denoted to feeling of sadness, withdrawn and a sense of social isolation, feeling helpless, feeling lonely, crying, feeling emotional, and dependability (See Table 1 above).

The CFA was carried out using AMOS and employing maximum likelihood estimation. The initial model was run and resulted in poor fit (CFI = .81; GFI = .80; NFI = .61; TLI = .79; RMSEA = .06; SRMR = .06) (see Table 2). The analysis of the modification indices in AMOS indicated that significant improvement could be achieved if error terms of items of the scale are correlated (Arbuckle & Wothke, 1999). Covariance between the error terms was added, though it was tried to add a minimum number of covariance to obtain the model fit. It was ensured that all the covariance have strong theoretical or logical grounds. Moreover, after co-varying the error terms, items explaining minimum variance and having low loading were removed to improve the model as these items are also considered as a source of error in the model.

In this way 4 items were removed from the model. Twenty eight of the 32 remaining items loaded successfully on the factors that had been ascribed in the EFA, with an excellent fitting model (CFI = .92; GFI = .90; NFI = .81; TLI = .91; RMSEA = .04; SRMR = .05) see Table 2. Hu and Bentler (1999) recommend the criteria of relative indices, RMSEA and SRMR values should be .08 or lesser and CFI, NFI and GFI values of .9 or higher are considered as good while $.9 \leq .8$ is considered permissible sometimes. Though significant $p < .001$ Chi-square suggests a poor fit, however the ratio of CMIN/*df* (1.59) is in the recommended range (Hooper et al., 2008; Schumacher & Lomax, 2015) See Table 2.

Table 2

Fit Indices of CFA Analysis for PSP-VI

Model	χ^2	*df*	χ^2/df	*GFI*	*CFI*	*NFI*	*TLI*	*RMSEA*	*SRMR*
1st Model Fit (PSPS)	969.71	461	2.10	.80	.81	.61	.79	.06	.06
Final Model Fit (PSPS)	515.20	324	1.59	.90	.92	.81	.91	.04	.05

Note. All change in Chi square values are computed relative to model, χ^2>.05, GFI = Goodness of Fit index, CFI = Comparative Fit Index, NFI = Normative Fit Index; TLI = Tucker Lewis Index, RMSEA= Root Mean Square Error of Approximation, SRMR = Standardized Root Mean Square Residual.

Keeping in view the values of these indices, item loadings and squared multiple correlations of three factors of PSP-VI are depicted in Figure 1below that fall within acceptable range and meet the selection criteria of factor loadings ≥ .40.

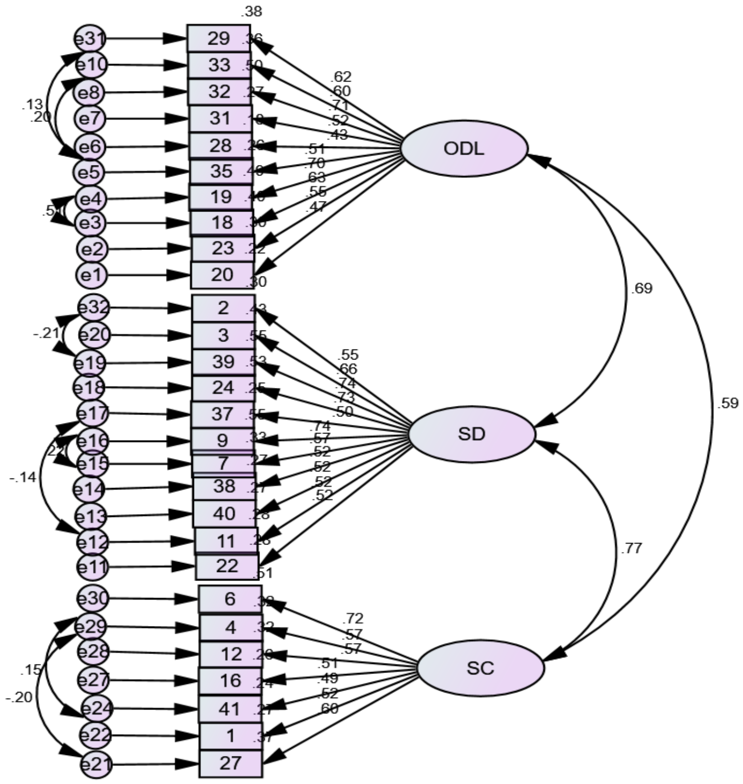

Figure 1. CFA of PSP-VI

The correlation (r = -.34) between PSP-VI and MSPSS was significant, indicating good divergent validity. In the first step to assess convergent validity, factor loadings of scale items on their respective constructs were examined along with the composite reliability (CR) estimates and average variance extracted (AVE) values (Fornell & Larcker, 1981). All factor loadings of the items were above the threshold value of .4 for a newly developed measure (Hair et al., 2010

As shown in Table 3, PSP-VI had high, internal consistency (α) along with its subscales, composite reliability (CR) estimates and average variance extracted (AVE) values were well above the satisfactory cutoff thresholds of.7, .7 and .25 respectively as shown by α, CR and AVE in Table 3(Hair et al., 2010;Henseler et al., 2016).In current study reliability (α)for total and sub-scales of PSP-VI ranged from .80 to .90; CR ranged from .77 to .85 and AVE ranged from .32 to .37. The split-half reliability was established by using even and odd method and was (r=.85) where internal consistency for both halves was (r = .87) and (r = .85) respectively. Table 3 also indicates PSP-VI total score and its three subscales were significantly negatively associated with MSPSS.

Table 3

Inter-correlations between PSP-VI and MSPSS

Variable	1	2	3	4	5
1. PSP-VI total	-	.84*	.86*	.81*	**-.34***
2. Opportunities in Daily Living		-	.57*	.49*	-.22*
3. Social Discrimination			-	.61*	-.26*
4.Self-Concept				-	-.34*
5. MSPSS					-
A/**α**	.90	.84	.80	.89	.76
CR		.83	.85	.77	
AVE		.36	.37	.32	
M	34.01	15.52	9.14	9.35	63.81
SD	12.67	5.47	4.87	4.96	11.66

Note. CR = Composite Reliability, AVE = Average Variance Extracted, *df*=558, **p*<.01, †*p*<.001

Discussion

Complete or partial visual loss is associated with many psychosocial stressors resulting from physical, economic, social and emotional conditions. In Pakistan blindness is associated with low socioeconomic status, lack of healthcare facilities, lack of education and awareness (Gilbert et al., 2008). The current study was a ground breaking attempt in Pakistan to look at the psychosocial problems experienced and expressed by individuals with VI and developed a culturally appropriate measure that was psychometrically sound to assess the intensity and frequency of these problems. Findings confirm previous studies where visual impairments (VIs) have shown exacerbation of emotional and social problems (Garaigordobil & Bernarás, 2009;Guo et al.,2017; Hadidi & Al Khateeb, 2013;Kempen et al., 2012).

The PSP-VI was found to have high internal consistency, reliability and validity confirmed by EFA and CFA analyses. The first factor (Opportunities in Daily Living subscale) measured experiences that were related to impoverished social, emotional and academic growths. Individuals with VI believed that they were either excluded from the mainstream educational and social set-ups or experienced having fewer opportunities to interact with sighted people that lead to social isolation, loneliness and lack of social skills, such findings have also been documented in western literature (Brown et al., 2014; Crews et al., 2016; Welp et al., 2016; Whitson et al.,2014).

Second factor (Social Discrimination subscale) measured thoughts and views of visually impaired individual about how their cultural lacks of knowledge about visual impairment, lacks understanding and awareness of feelings visually impaired people, holds stigma and myths associated with visual impairment and disabilities and isolates and marginalizes people with disabilities. Individual with visual impairments experience verbal bullying, name calling, lack of empathetic attitude from peers, teachers and society at large that increases disability burden and dysfunctionality.

The last factor (Self-Concept subscale) measured feeling and experience of self-concept in visually impaired individuals. This may be because people with VIs have fewer opportunities to make friends, and limited social interactions, so they experience the feelings of being helpless, isolated, neglected, devoid, and destitute (Huurre et al., 2001).

The findings of the present study suggest rehabilitation programs for individuals with VIs should be in place. In particular, this study confirms the need of social support, teacher training, rehabilitation strategies and psycho-education of the family to increase psychosocial and emotional well-being, and facilitate people with VIs.

Despite several strengths, our study presents certain limitations also. Since the participants of the study were students with VI studying in urban areas, the findings can’t be generalized to the rural context. The non-probability sample of the students with visual impairment is another possible limitation of the study. Present study used a cross sectional method, a longitudinal approach may be used in future research to develop scale with greater predictive validity

Conclusion

The developed scale is groundbreaking in empirically measuring experiences of people with VI, no such scale is available or in use in Pakistan. The scale is reliable and valid and can be used by special education schools to assess experiences of their students that are visually impaired. The instrument can also be used for incoming students at these institutions so that teachers and faculty can address student issues right at the start of their school life. And with time the scale can provide valuable data to motivate policy makers in funding facilities for people with disabilities like visual impairment.

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