

## Psychosocial issues of hearing impaired school children: a psychometric approach

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### Abstract

**Objective:** To develop a valid and reliable scale for measuring psychosocial issues of hearing-impaired school children.

**Method:** The cross-sectional study with four stage model of scale development was conducted at Multan, Muzafargarh, and Dera Ghazi Khan Pakistan from August 2018 to January 2019. The four stages were item generation, expert validation, conversion of scale into sign language and psychometric study. The sample comprised hearing-impaired school children aged 18-23 years who were studying Special Education schools in Multan, Pakistan.

**Results:** Of the 230 subjects, there were 110(47.8%) boys and 120(52.2%) girls. The overall mean age was  $19.90 \pm 2.46$  years. Exploratory factor analysis with varimax rotation revealed 26 items in 'Depressive Affect', 'Social Isolation' and 'Feeling of Anger' sub-scales with high internal consistency ( $r=0.85$ ) and validity ( $r=0.32$ ).

**Conclusion:** The internalised nature of psychosocial issues of children with hearing impairment needs timely identification and intervention so that silent suffering can be prevented to improve psychosocial functioning of such children.

**Keywords:** Hearing impairment, Psychosocial issues, Gender, Age, Reliability, Validity. (JPMA 71: 306; 2021)

**DOI:** <https://doi.org/10.47391/JPMA.812>

### Introduction

Ear is one of the most important human organs which helps to understand and interpret external information and maintaining balance.<sup>1</sup> The mechanical waves of sound travels through a complicated pathway of three parts of the ear to reach the brain as electrical waves.<sup>2</sup> Any disruption in this path generates serious consequences including total or partial hearing impairment (HI).<sup>3</sup> HI is either caused by congenital or acquired factors, including genetics, virus attacks, premature birth, low birth weight (LBW), cousin marriages and birth complications.<sup>4</sup> It is one of the most common sensory deficits in children, with a prevalence of about 1-3 children in 1000.<sup>5</sup> Globally, 3.6 billion people are suffering from hearing problems and children <15 years of age represent 9% of this proportion.<sup>6</sup>

Though HI is a medical condition, it affects an individuals' psychosocial and emotional functioning. The impairment not only constrains functionality, but may lead to long-lasting negative outcomes ranging from poor academic performance and interpersonal problems to sense of loneliness and limited job opportunities.<sup>7</sup> The common

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emotional behavioural problems HI children encounter include adjustment problems, low self-esteem, and social withdrawal.<sup>8</sup> HI triggers other problems, like depression, anxiety and anger, because they are not able to communicate their anger appropriately, causing them to be more aggressive than the other children.<sup>9</sup> Pakistan is a developing country which lacks basic health and education facilities and typical cultural-religious beliefs make disabilities even worse. About 2.49 Pakistanis are known to carry some disability and 7.4% of them are HI.<sup>10</sup> Overall disability rate in Pakistan has increased from 2.03% to 2.65% and HI is higher in males than females.<sup>11</sup>

The current study was planned to develop a reliable and valid scale for measuring psychosocial issues of hearing-impaired school-children (HISC).

### Subjects and Methods

The cross-sectional study with four stage model of scale development was conducted at Multan, Muzafargarh, and Dera Ghazi Khan Pakistan from August 2018 to January 2019 and comprised HISCs aged 18-23 years studying at Special Education schools in Multan, Pakistan. The sample was raised using purposive sampling from among those who had congenital HI, were studying in classes 8-10 and used only sign language as the mode of communication. Children with other disabilities and cochlear implantation were excluded.

The first phase comprised item generation of psychosocial issues of HI. In order to explore the experience and expression of psychosocial issues of HISCs, a phenomenological approach was used. The participants of this phase were 30 school children (15 boys and 15 girls) with age range of 18-23 years ( $M=19.90$ ,  $SD=2.46$ ). After taking informed consent from the subjects and permission from the school administration, sign language sessions were conducted with each participant separately. With the help of a sign language specialist, the participants were interviewed with an open-ended questionnaire to indicate the problems they experienced due to HI. The responses were noted verbatim, and collated in the end, producing a list of 50 items related to the psychosocial problems of HISCs.

Phase II was expert validation for which 5 clinical psychologists with at least ten-year experience of working with HI children were invited who examined them carefully and rated them in the light of their professional experience from 0 = no occurrence at all to 4 = most occurring. Only those items that were rated 4 by all the experts were retained, while the others were excluded. This led to a list of 30 items.

In Phase III, the Psychosocial Issues of HISCs (PIHISC) scale was converted into sign language (SL) to make it user-friendly. The well-established forward and backward translation method was employed for the purpose. In the first step the scale was translated into SL by two bilingual teachers with 5 years of experience. They were asked to translate each item into SL while keeping the conceptual, age and stage of HI into consideration. In the next step, the scale was translated backward into Urdu by two bilingual teachers who had 10 years of experience of

working with HI children. In the 3rd step, 1 HI bilingual and 1 hearing bilingual teacher compared the actual scale and back-translated scale for clarity and meaning.

The changes suggested by two teachers were incorporated in the SL version to sustain the validity of the actual scale. For reducing ambiguity, the items were again discussed with the evaluators. The scale was converted into SL again till a consensus was made on the conceptual uniformity of the items. This process of converting into SL was done twice and was considered completed when consensus was reached.

The finalised list of 30 items was transformed into a self-reporting tool with 4-point Likert scale ranging from 0= never) to 3 = always. A pilot study comprising 20 HISCs indicated the scale was user-friendly with no ambiguity.

Exploratory factor analysis (EFA) and test-retest reliability were checked and further validity was analysed by verifying the correlation of PIHISC with the Multidimensional Scale of Perceived Social Support (MSPSS).

## Results

Of the 230 subjects, there were 110(47.8%) boys and 120(52.2%) girls. The overall mean age was  $19.90\pm 2.46$  years. Of the total, 71(31%) subjects had mild HI, 79(34%) had moderate and 80(35%) had severe HI.

EFA was carried out with varimax rotation. Extraction of factors was based on Eigen value  $>1$ , modulation point of scree and least loading of 0.30. In order to get the best fit model, multiple combinations with different numbers of factors like 5, 4, 3 and 2 with 0.30 and 0.40 factors loading and promax, varimax rotations were administered, a clear

**Table-1:** The factor structure with Eigen value of three factors of psychosocial problems scale for hearing-impaired school children (PIHISC) (N = 230).

Item	F1	F2	F3	Item	F1	F2	F3
1	.55	.24	-.21	8	-.05	.46	.03
2	.71	.26	-.18	12	.24	.40	-.07
3	.60	.12	.03	13	-.27	.70	-.06
4	.61	-.05	-.14	14	-.12	.80	.17
5	.55	-.07	.05	15	-.16	.63	.10
7	.36	.25	.09	16	.18	.54	.01
9	.72	.15	.02	28	.29	.49	.18
10	.66	.04	-.19	29	.02	.50	.08
18	.49	.14	-.02	30	.08	.56	.22
20	.62	-.04	-.02	24	.18	-.01	.86
21	.45	.25	.04	25	.18	-.04	.39
22	.44	.39	.28	26	.18	.29	.78
6	-.04	.49	.11	27	.18	-.09	.85
Eigen Value	4.53	3.75	2.71	% of Variance	15.12	12.50	9.04

Note: Factor loading  $>0.30$  have been bold faced.

**Table-2:** Summary of inter-factor correlations and Cronbach alpha of the three factors of PIHISC (N=230).

Factors	Depressive affect	Social isolation	Feeling of anger	Factor total	K	$\alpha$
F1	-	.19*	.17	.75***	12	.80
F2	-	-	.07	.71***	10	.76
F3	-	-	-	.48***	4	.86
F_Total	-	-	-	-	26	.85
M	14.62	14.62	14.62	36.14		
SD	4.41	4.41	4.41	7.53		

Note: \*\*\* $p < .001$ , \*\* $p < .01$ , \* $p < .05$ , PPSHISC = Psychosocial Problem Scale for Hearing Impaired School Children, F1= depressive affect, F2= Social isolation, F3= feeling of anger.

conceptual picture was presented only by a combination of three factors with 0.30 factor loading and varimax rotation. This combination was finalised to extract maximum common variance of the variable. The PIHISC scale had three factors with 26 items scored on a three-point Likert scale. For factor description, each factor was labelled on the basis of commonality of themes after close examination of the items corresponding to each factor and the theme (Table-1).

The first factor was 'depressive effect', which is defined as tendency to feel low and sad. This sub-scale had total 12 items and denoted respondent's increased feeling of sadness or depressiveness. Items revolved around the phenomenon of loneliness, being unhappy and hopeless, anxiousness, pessimistic, helplessness, crying, feeling alone and getting hurt easily by others.

The second factor was 'social isolation' which is a state of complete or partial absence of social contact with others. This factor comprised 10 items describing the feeling of being ignored by others, not going outside, not taking part in activities, impression of not being understood by others and folks around not paying attention or interest in what the person intended to say.

The third factor was 'feeling of anger' which had 4 items including breaking things, wanting to kill others when angry, and becoming angry very quickly.

A significant correlation was found among the factors and the sub-scales were independent and distinct in their nature because of the level of significance of the factors (Table-2).

The test-retest reliability confirmed ( $p=0.85$ ), proving that it was a reliable measure for assessing psychosocial problems of HISCs.

The test-retest was done again on randomly selected subjects after two weeks of the first administration and  $r=0.87$  indicated high reliability.

In terms of psychometric properties, the scale had a

sound face validity because the items seemed to measure the psychosocial problems HISCs were facing.

Further validity examination was done by correlating PIHISC with MSPSS which showed an inverse correlation ( $r=-0.32$ ), indicating higher divergent or discriminant validity of PIHISC.

## Discussion

Literature has mostly focussed on studying psychological aspects of HI while using parents or teachers and the individual's own perspective has largely remained neglected.<sup>12</sup> The current study attempted to look at the psychological experience of HI children which resulted in three distinct factors and 26 items on the scale. These three factors were consistent with literature.<sup>7</sup> HISCs were tended to feel angry.<sup>13</sup> Deafness causes a lot of frustration because such children cannot understand others and vice versa. They tend to lose temper quickly, feel irritable and frustrated, which eventually worsens their psychological condition.<sup>14,15</sup> The current study had a limitation as the researchers were not proficient in sign language which could have had a direct effect in terms of understanding and interactive with the subjects to some extent.

## Conclusion

The internalised nature of psychosocial issues of children with hearing impairment needs timely identification and intervention so that silent suffering can be prevented to improve psychosocial functioning of such children.

**Disclaimer:** None.

**Conflict of Interest:** None.

**Source of Funding:** None.

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