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DEVELOPMENT OF AN INDIGENOUS SELF-CONCEPT SCALE FOR HEARING -IMPAIRED SCHOOL CHILDREN: AN EXPLORATORY APPROACH

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ABSTRACT

This study aimed to develop & validate comprehensive Self-Concept Scale for the Hearing-Impaired School Children (SCSHISC) by employing rigorous methodology. The unique challenges faced by hearing-impaired children in communication and interpersonal engagement underscored the need for accurate measurement tool. The study's purposive sampling approach included 230 participants, ensuring representativeness. The factor analysis revealed two distinct factors: "Discomfort within self" and "Incompetence," capturing feelings of unease, inferiority & communication challenges. The scale exhibited high internal consistency (α = .78 for "Discomfort within self" and α= .65 for "Incompetence"). SCSHISC confirmed robust psychometric properties, making it a valid tool for assessing the self-concept in SCSHISC. While limitations include a small sample size & potential response bias, this study contributes significantly to field by providing reliable measurement instrument that boosts understanding of self-concept dynamics among hearing-impaired students. Therefore, the SCSHISC can facilitate targeted interventions to foster positive self-perceptions & psychological well-being in this population.

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INTRODUCTION

The self-concept of Hearing-Impaired (HI) school children is a serious characteristic of not only their psychological well-being but also overall development, given the distinct challenges they face in communication and interpersonal relationships (Nasir & Lin, 2012). As higher levels of self-concept have been associated with increased resilience in facing life challenges, while lower self-esteem is linked to various issues such as loneliness, peer refusal, hostility, criminal behavior, and psychological disorders, so understanding & precisely calculating their self-perception is essential (Theunissen, Rieffe, Netten, Briaire, Soede, Schoones & Frijns, 2014). Though the necessity of self-

concept in HI school children has been recognized, there is a distinct requirement for an ingenious tool personalized to the experiences of HI school children in the Pakistani culture. This research is motivated by limitations of existing scales that may not be culturally appropriate and the indirect approaches relying on parents or teachers to assess the self-concept of HI children (Polat, 2003). To address these gaps, the current research endeavors to directly elicit self-concept perceptions from HI school children. Furthermore, there is a notable absence of a dedicated questionnaire designed specifically for measuring the self-concept of this population. By creating a culturally relevant scale, this study aims to explore and comprehensively understand the phenomenon of self-concept in HI school children.

LITERATURE REVIEW

Research on self-concept of individuals, including HI children, is important for their overall health, particularly effecting the psychological health (Kosma, Cardinal & Rintala, 2002). Pettala and Rajaguru (2016) highlighted effectiveness of interventions targeting self-concept & psychosocial problems in the hearing-impaired population in their research, and gave emphasis to the need for standardized and psychometrically validated tools to measure it. Knoors and Marschark (2014), emphasized need for culturally sensitive and contextually relevant measurement tool for assessing self-concept in HI children. The study underlined the shortcomings of existing scales in capturing the nuanced features of self-concept that are exclusive to experiences of HI children. Furthermore, the disputes arise from be dependent on parents or teachers to assess the self-concept of HI children were stressed. This aligns with the current study's approach of openly and directly bring about self-concept insights from the HI school children themselves. Mental health of HI individuals has been subject of increasing concern, with many researches indicating higher prevalence of mental health issues in the HI population (Theunissen, Rieffe, Netten, Briaire, Soede, Kouwenberg & Frijns, 2014). Theunissen, Rieffe, Soede, Ketelaar, Kouwenberg and Frijns (2015) stated that people with higher self-concept are observed to navigate life challenges efficiently, showing the better flexibility and adaptive coping strategies.

On the other hand, lower self-esteem has been linked with feelings of isolation, peer rejection, and increased vulnerability to the mental ailments (Theunissen et al., 2014). Despite the fact that the management plans targeting self-concept and psychosocial problems in HI population have shown promise (Pettala & Rajaguru, 2016), the lack of a standardized and psychometrically validated psychological measures remains a major gap in the area. The existing psychological instruments for measuring self-concept in HI don't capture the cultural specifications and unique experiences of HI school children in Pakistan. There is a need consult with experts and community members to ensure that the scale is appropriate and respectful of cultural context. As a result, the current study aims to contribute to the progression of research and intervention efforts by developing a vigorous and indigenous tool for assessing self-concept in this HI population. In this connection, the study draws on the existing research, including studies exploring the self-concept of the HI individuals conducted by Mekonnen et al. (2016). This wide-ranging methodology ensures that the developed the measurement tool includes the distinct aspects of the self-concept that are most relevant to the experiences of HI school children, that too in our culture. Thus, by undertaking a rigorous validation

process, the researchers aim to create a reliable tool that can be used effectively in the research and intervention plans.

The main objective is to offer educators, researchers, and the mental health professionals with an instrument that not only precisely quantify self-concept in the HI school children but also informs directed management to improve their mental well-being. The primary objective of developing and validating the self-concept measurement tool for the HI school children is to offer researchers, educators, and practitioners a reliable instrument for evaluating and tracking the self-perceptions of this specific population. In this linking, the collaborate with indigenous communities throughout the development process. Engage in a participatory approach to ensure that the scale is respectful and accurately reflects the perspectives of the community. The utilization of this tool will enhance our understanding of intricate dynamics of self-concept among HI students and provide valuable insights for designing required interventions that aim to cultivate positive self-perceptions and psychological well-being. By addressing the limitations of existing measures and incorporating the unique experiences of individuals with the hearing impairment, this study endeavors to make a significant contribution to field of self-concept assessment and intervention for HI school children. Ultimately, the availability of a psychometrically sound and contextually relevant measurement tool will support professionals in effectively supporting the self-development and overall success of HI students.

RESEARCH METHODOLOGY

The development of the SCSHISC involved a systematic and multi-stage process. This process encompassed initial item generation, content validation, pilot testing, and subsequent refinement of the scale. Through these iterative stages, the scale was carefully crafted to capture the unique aspects of self-concept experienced by this specific population. The rigorous development process ensures that the scale is psychometrically sound and relevant for assessing the self-perceptions of HI school children.

Stage I: Phenomenological inquiry

Sample & Sampling

For study, a purposive sampling technique was utilized to carefully select a sample of 30 HI school children, evenly distributed between genders with 15 boys and 15 girls. The participants' age range was between 19 to 24 years, with a mean age of 21.50 years and standard deviation of 1.90. the range of the hearing impairment were mild to profound, and they were studying in grades 8, 9 and 10 in government schools. All participants had congenital hearing impairment and predominantly used sign language as their primary mode of communication. By including children with different levels of hearing impairment & common mode of communication, study sought to capture representative sample of target population.

Research Procedure

Through open-ended interviews conducted in sign language, participants were invited to share their thoughts & perceptions about themselves. To ensure accurate responses, additional questions were asked for clarification. The interviews were recorded to preserve the original meaning, with a

teacher present to assist in translating participants' sign language responses. The interviews lasted an average of 40-50 minutes, and a debriefing session followed to address any participant queries or concerns. In this connection, each interview was transcribed individually, as well as a thorough examination of the transcripts led to identification of 40 items that were clear and unambiguous in capturing self-concept. Thus, these items were compiled into a list (Appendix A). To transform the qualitative responses into quantitative self-report measure, the methodology proposed by scholars, Trochim and Donnelly (2007) was employed. This involved carefully analyzing and categorizing the responses to create a structured instrument that could be reliably used to assess self-concept in HI school children.

Stage II: Expert Validation

The purpose of this stage was to seek expert consensus on the content gathered in initial stage, thus providing scientific validation for the measurement claims (Boateng, Neilands, Frongillo, Quiñonez & Young, 2018). Obtaining expert input was of great significance in evaluating the adequacy and relevance of collected data.

Participants & Procedure

In this stage, panel of five experts, consisting of clinical psychologists and teachers with experience working with HI school children, was selected to validate the collected 40 items on the self-concept of HI children. Experts were chosen based on their expertise and their involvement with HI children in their professional roles. They were given clear instructions to evaluate each item thoroughly and rate the likelihood of its occurrence in the HI children on a scale ranging from 0 to 3. A rating of 3 indicated a high likelihood of occurrence. Only items that received a rating of 3 from the experts were retained for further analysis. Thus, as a result of the experts' ratings, a total of 25 items were considered suitable for the subsequent stages of the current study. These items formed a refined set of indicators for measuring the self-concept of HI school children ensuring the content validity of the measurement tool.

Stage III: Converting SCSHISC into Sign Language

To accommodate the needs of hearing-impaired (HI) population, newly developed self-concept measure was carefully adapted into sign language. The rigorous forward and backward method of translation was implemented. Initially, two bilingual teachers, well-versed in working with hearing impaired school children and serving as speech therapists, were selected for task. They translated each item of Self-concept Scale into sign language, prioritizing the conveyance of the conceptual meaning rather than pursuing a literal translation approach. The chosen signs were natural and widely recognized by hearing impaired children. In subsequent step, the translated sign language scale was presented to two teachers proficient in both sign language and the Urdu language. Their role involved translating sign language phrases back into equivalent sentences in the written form. In third stage, two teachers, one bilingual HI and one bilingual non-hearing impaired, meticulously examined both original scale and back-translated scale. Their objective was to assess equivalence & clarity of sign language adaptation. Ambiguous items were carefully discussed with evaluators and process of converting the scale into sign language was repeated until a consensus on 25 items were achieved.

Stage IV: Pilot Study

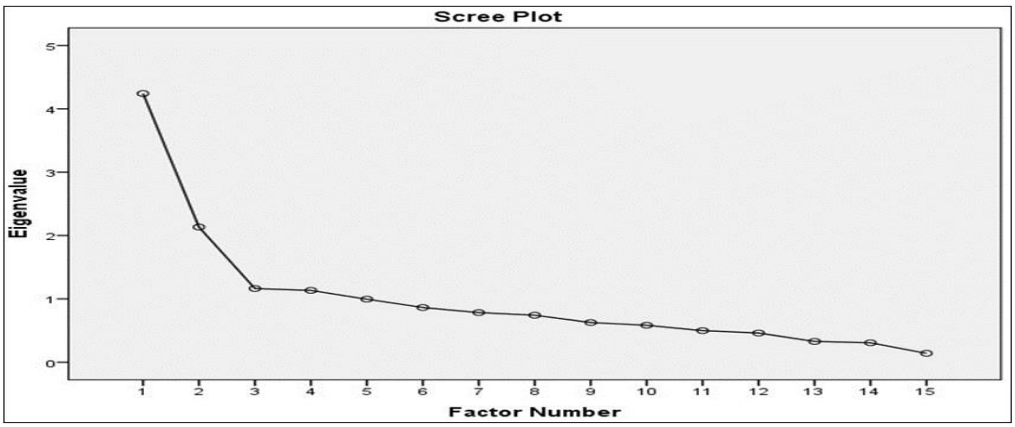
A pilot study was conducted involving a sample of 20 HI children, evenly distributed between boys and girls, aged between eight and ten years. The self-concept scale was individually administered using sign language. Each item was presented to the children, who were instructed to indicate their response by selecting appropriate option. A Likert scale was utilized for rating and scoring, ranging from 0 to 3, representing different levels of frequency. Specifically, 0 denoted "no occurrence," 1 represented "sometimes," 2 indicated "most of times," and 3 signified "always." The findings from the pilot study indicated that self-concept scale was easily comprehensible, and the participants did not report any difficulties in understanding or responding to the items. Based on these results, a final version of self-concept scale comprising 25 items, utilizing four-point Likert scale, was determined for further investigation in subsequent phases of study. Sample and Sampling technique: In order to ensure a representative sample, researcher utilized a purposive sampling approach to carefully select 230 participants for study. Children that were involved in development & pilot stages were excluded in this phase.

Research Procedure

During the data collection phase, developed self-concept scale was administered to participants in group sessions. To ensure comprehension and accessibility, instructions were provided in the sign language, which is the primary mode of communication for the HI population. In the event that participants had any queries or required clarifications regarding the statements in the scale, they were encouraged to approach the researcher. Researcher, proficient in sign language, addressed their inquiries by translating them into sign language, by facilitating effective communication. This approach aimed to create a comfortable and inclusive environment for the participants, enabling them to fully engage with the SCSHISC and provide accurate responses. By utilizing sign language instructions and offering support for clarifications, the researcher ensured that the participants' perspectives and experiences were effectively captured, enhancing the validity and reliability of the data obtained.

RESULTS OF STUDY

Figure 1 Scree Plot Showing Extraction of SCHISCS



Exploratory factor analysis was performed, exploring different factor solutions ranging from 6 to 2 factors. Factor loadings of .40 and .30 were utilized to identify best fit model. However, most of these solutions did not yield clear results and led to ambiguous items. Among the various factor solutions, the 2-factor solution using Principal Axis Factoring with Promax rotation and .30 factor loading demonstrated a coherent representation of the underlying factors. This solution was selected based on Kaiser-Guttman's retention criterion of Eigen values (Watkins, 2018), as it provided clearer and more meaningful interpretation of the data. Out of the initial 25 items, 5 items exhibited low factor loadings and one item (18) did not load onto any factor. 14 items revealed satisfactory loadings. By selecting items with higher factor loadings, excluding those with weaker associations, final 2-factor solution was established, ensuring a more robust and reliable measurement of self-concept in HI school children.

Factor Analysis of Self Concept of SCSHISC

Exploratory factor analysis was conducted on SCHISCS scale to gain comprehensive understanding of the raw data. The analysis utilized Exploratory method of Principle Axis Factoring with Promax Rotation, extracting 2 factors from the 15 scale items. Selection of factors was based on the criterion that the Eigen value should be greater than 1, as recommended by Watkins (2018). The Scree plot was used to determine number of factors, considering only those factors that fell within the elbow of plot & had factor loadings above .30. Moreover, adequacy of measure was assessed using Kaiser-Meyer-Olkin and Bartlett values, with KMO value of .72 indicating satisfactory factor adequacy (Watkin, 2018).

Table 1 Factor Structure Analysis: SCSHISC (N=230)

SN	Items	FI	FII
1.	SCSHISC7	.52	-.01
2.	SCSHISC8	.74	-.08
3.	SCSHISC9	.52	.23
4.	SCSHISC10	.51	.17
5.	SCSHISC12	.63	-.09
6.	SCSHISC13	.54	-.05
7.	SCSHISC15	.46	.09
8.	SCSHSC20	.51	-.07
9.	SCSHSC21	.37	.19
10.	SCSHISC1	-.03	.78
11.	SCSHISC2	-.07	.90
12.	SCSHISC3	.08	.54
13.	SCSHISC4	-.15	.77
14.	SCSHISC5	17	.32
	Eigen Values	3.63	1.60
	% Of Variance	24.21	10.68
	% Of cumulative variance	24.21	34.68

Note: Factor loading >.30 is in bold face

Factors Description of SCSHISC

The SCSHISC comprised 14 items, assessed using a four-point Likert scale. Two factors were derived from the scale, reflecting distinct themes observed in the items. The factors were labeled based on a

thorough analysis of the items, identifying the specific themes they represented. Discomfort within self. First factor of SCSHISC was named "Discomfort within self." This factor encompasses emotions of unease, anxiety, and discontentment with oneself. It represents internal conflicts and a feeling of inner discomfort, often leading to embarrassment. With an Eigen value of 3.6, this factor comprises nine items. These items revolve around themes like sense of worthlessness, hopelessness, inferiority, and a lack of direction in life goals. Participants' responses to these items provide insight into their perception of the internal discomfort and the challenges they face in relation to their self-concept. Incompetence. The second factor of the SCSHISC was named "Incompetence." This factor captures a perception of inadequacy, specifically in terms of communication skills and overall comprehension. HI children may view themselves as being ineffective in their ability to communicate and believe that others perceive them as incapable or lacking competence. Consequently, they develop a sense of inferiority and extend this perception of incompetence to various aspects of their lives. This factor comprises five items, with an Eigen value of 1.60, which address themes such as the difficulties in expressing oneself, limited understanding, and a perceived lack of skills and abilities. Participants' responses to these items shed light on their self-perceived incompetence and its impact on their overall self-concept.

Table 2 Means, Standard Deviations, Inter-Factor Correlation

Factors	F1	F2	F _Total
F1 Discomfort within self	-	.33***	.86***
F2 Incompetence	-	-	.73***
F_Total	-	-	-
M	10.52	11.09	21.63
SD	4.28	2.90	5.89
A	.78	.65	.73

Note. ***p<0.001, SCSHISC= Self Concept Scale for the Hearing-Impaired School Children, F1= discomfort within self, F2= incompetence, α= Cronbach's alpha, SCSHISC= Self Concept Scale for Hearing Impaired School Children

Pearson product moment correlation was employed to analyze the relationship between different dimensions of self-concept in HI school children. The findings demonstrated significant correlations among the various factors and overall scale. Inter-factor correlations were particularly noteworthy as they were highly significant, indicating robust association between different factors. Moreover, the factors exhibited significant positive correlations with the total factor scores, underscoring the interconnectedness and coherence of self-concept dimensions. These results highlight interrelated nature of the factors and provide valuable insights into the complex structure of self-concept in HI school children. Alpha coefficients indicated that sub-scales and scale as whole, have good degree of internal reliability.

Table 3 Test-Retest Reliability Analysis of SCSHISC

Variables	SCSHISC _ Test	SCSHISC _ Retest
SCSHISC_ Test	-	.43***
SCSHISC _ Retest		-

Note = ***p< 0.001, SCSHISC = Self-Concept of Hearing-Impaired School Children

Test-retest reliability coefficient of .43 for SCSHISC scale suggests a moderate level of consistency in scores over time.

Table 4 Correlation of Total SCSHISC with Semantic Differential Scale (N=50).

Variables	Self-Concept	Semantic Differential
Self-Concept	-	.30**
Semantic Differential		-

Note. ** p< 0.01

Convergent validity was assessed by examining the correlation between the newly developed self-concept scale as well as an established semantic differential scale (Carmines & Zeller, 2020). The significant positive correlation ($r = .30$, $P < .05$) observed between the semantic differential scale and newly developed Self-concept scale provides evidence of convergent validity. This indicates that the two scales are measuring similar constructs related to self-concept in hearing-impaired school children.

DISCUSSION

The main objective of present study was to develop and validate SCSHISC, a psychometrically sound measurement tool to assess the self-concept of hearing-impaired school children. Study employed rigorous testing procedures to evaluate scale's psychometric properties, including factor analysis, internal consistency, test-retest reliability, and convergent validity. Factor analysis was conducted to identify the underlying factors of self-concept scale. Kim and Mueller (1978) say factor analysis is a crucial to identify the underlying factors that explain patterns in the data, helping researchers understand the structure of psychological constructs. It is essential for developing and validating theories and measurement instruments in the psychology. Analysis revealed the emergence of two distinct factors: "discomfort within self" and "incompetence." Factor "discomfort within self" captured feelings of uneasiness and inferiority. Batten et al. (2013) found that negative attitudes toward HI individuals, social isolation, communication difficulties, and a lack of appropriate role models can lead to feelings of inferiority and discomfort within oneself, which negatively affect self-concept. Still, the factor "incompetence" represented a sense of ineptitude in communication skills as well as overall perception.

The communication difficulties, language delays, social challenges and the educational limitations contribute to the perceived incompetence and subsequently impact self-concept (Overgaard et al., 2021). These factors provide a comprehensive understanding of the different aspects of self-concept in HI children. The internal consistency of scale was assessed using Cronbach's alpha coefficients. First factor, "Discomfort within self," demonstrated good internal consistency ($\alpha = .78$), indicating that items within this factor are strongly related and measure the same construct. The second factor, "Incompetence," showed acceptable level of internal consistency ($\alpha = .65$), suggesting reasonable coherence among the items. The overall SCSHISC scale exhibited acceptable internal consistency ($\alpha = .73$), indicating that it is a reliable measure of self-concept in HI school children. To examine the stability of the scale over time, test-retest reliability analysis was conducted. The initial and retest scores of the participants were compared using correlation analysis. The test-retest reliability

coefficient of .43 for the SCSHISC scale suggests a moderate level of consistency in the scores over time. While this coefficient may seem relatively low, it is important to consider the specific context of current study.

The population under investigation consists of HI individuals, who may face unique challenges and variations in their self-concept over time. Factors such as external influences, personal experiences, and changes in individual perceptions may contribute to the observed variability in the test-retest scores (Gifford & Nilsson, 2014). Convergent validity was established by assessing the relationship between the SCSHISC and semantic differential scale, which measures similar constructs related to self-perception. The results indicated significant positive correlation between the scores of the two scales, supporting convergent validity of SCSHISC. This suggests that SCSHISC effectively captures self-perception of HI children and aligns with other established measures of self-concept. Overall, findings of this study provide strong evidence for psychometric soundness and validity of SCSHISC. The scale demonstrated clear factor structure, high internal consistency, test-retest reliability, and convergent validity. These findings support use of SCSHISC as reliable & valid tool for assessing self-concept in HI school children.

CONCLUSION

In conclusion, the present study successfully developed and validated the SCSHISC, which showed strong psychometric properties. The scale consisted of the two factors, capturing the dimensions of "Discomfort within self" & "Incompetence" among HI school children. It demonstrated high internal consistency, good test-retest reliability, and convergent validity. These findings support SCSHISC as a reliable and valid tool for assessing self-concept of HI school children in research and clinical settings (Carmines & Zeller, 2020). This study has important strengths but also limitations. One of the limitations is the small sample size used in the study, which may restrict the generalizability of the findings. Additionally, it remains uncertain how applicable the scale is to different age groups or educational settings. The reliance on the self-report measures could introduce response biases or limitations, particularly among younger participants. To enhance the validity of the scale, future research should consider incorporating multiple sources of the data and additional measures of the construct validity. Thus, despite these limitations, the study represents significant advancement in establishing the psychometrically sound measurement tool for assessing the self-concept in the HI school children.

Future Recommendations

Future research endeavors should consider expanding the scope of SCSHISC to encompass diverse age groups and educational settings. Investigating scale's applicability to diverse cultural contexts and languages will enhance its cross-cultural validity. Longitudinal studies could provide insights into stability & changes in self-concept over time in HI children. Further exploration of potential factors influencing self-concept, like social support & interventions, will deepen our sympathetic and contribute to targeted strategies for fostering positive self-perceptions and well-being in this vulnerable population.

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