

Development and Validation of Career Anxiety Scale for Adolescents with Hearing Impairment

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Self-rating anxiety scales are universally used in general adult practice; even then, there is not any reliable and valid method for evaluating career anxiety in students with hearing impairment in national language. The current study describes the development and validation of Career Anxiety Scale for hearing impaired individuals. Initially, forty nine items were generated by using the deductive and inductive method of items generation. In the second Phase, experts' opinion and pilot testing were done. As a result, the number of items of the scale was reduced to thirty five. In the third phase, the scale was administered on the sample of 847 high school and college students to have psychometric analysis. The value of coefficient of alpha was .92, split half reliability was .80, parallel reliability was .92 and test-retest Reliability was .83. The scale was cross validated with the Hamilton Anxiety Rating Scale and Undergraduate Anxiety Scale for students. Results of data showed that the concurrent validity of scale was .259 and .314 respectively which were significantly correlated at the 0.01 level. In the third phase, item analysis was done, and all items were retained. Then exploratory factor analysis revealed seven factors of the scale. After the expert's opinion, five dimensions were selected for the scale. The results revealed that CASH has evidence for reasonable content validity, good internal consistency reliability, and adequate concurrent validity and will be helpful in finding hearing impaired students' career anxiety.

Keywords. Career anxiety, self-rating scale, hearing impairment, reliability, validity

Anxiety has become one of the most common psychological disorders. [Ochi et al. \(2014\)](#) reported anxiety as the most widespread mental health problem throughout the world. Basic reasons behind the most prevailing symptoms of anxiety are the lifestyles demanding

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multitasking and additional responsibilities associated with distinct roles demanded by society (Schmid et al., 2011). Grupe and Nitschke (2013) and Czapinski and Peters (1991) highlighted two factors as sources of anxiety. First is the uncertainty about the future and the second is the past experiences affecting our anticipation about the future. An anxious individual is in a persistent state of worry and fears about life. Stress in life, genetics, brain chemistry (controversial), and environmental factors provoke anxiety in individuals (Dooley et al., 2015).

Anxiety often involves other physical symptoms like sweating, trembling, nausea, and a racing heartbeat. Besides, symptoms may include the fear of losing control, impending doom, or the fear of dying. While the symptoms of anxiety can be a part of everyday experience and help mobilize the body for emergencies, anxiety can become abnormal when it becomes excessive and irrational (Barlow, 2002).

The transition period for every student is particularly important. It is the phase when every individual thinks seriously about their future status and adjustment in life. Normally this period for students starts when their high school is about to end or has ended. It is the time to decide and plan for their future education and careers. In the case of individuals with disabilities, more care is needed because they face more problems during transition as compared to their peers without disabilities. Research findings revealed that individuals with disabilities are more vulnerable to remain unemployed or underemployed as compared to the individuals without disabilities. This segment of society usually tends to refrain from further education or job training due to their lack of indulgence in career development or career exploration activities (Bolton et al., 2006; Ochs & Roessler, 2004).

According to Punch et al. (2006), the functional limitations imposed by hearing loss and negative attitudes of people around them, are the most significant barriers for individuals with hearing impairment attending special schools or special education units within regular schools and who primarily use a sign language. Similar is the case of students in fully mainstreamed settings with itinerant teacher, as studies have reported least support available to manage these above-mentioned barriers. Luzzo and Hutcheson (1996) and Pulliam et al. (2017) found that the perception of career barriers may cause an anxious behavior during career decision-making process. Future career anxiety increases when perceived career constraints limit the degree of profession choice certainty.

Reilly and Suvannus (1999) reported that anxiety in deaf high school students is more complex about their employment, further education, and future life. They have many questions in their minds, such as where they will live in the future, how they will make decisions, how they will manage different situations, what are their vocational needs, will they get a job. Study reveals the mental health situation of deaf individuals as compared to a control sample of hearing individuals. This study showed that deaf respondents presented more symptoms of mental health problems as compared to hearing respondents. The findings pointed out the dire need for paying more attention to the state of mental health of deaf children and adults. More awareness should be created in society about the special risks which deaf children and adults face concerning mental health (Kvam et al., 2007).

According to Hyde et al. (2003), in most English-speaking countries, children having severe permanent hearing loss are currently enrolled and getting an education in regular classroom settings with the help of resource teachers. In Australia, 84% of the deaf and hard-of-hearing children are effectively educated and trained in normal regular classes using their residual hearing with support of speech reading and assistive hearing devices. On the contrary, In Pakistan, Ali (2007) found that due to the lack of trained staff, career guidance, career assessment and counseling, the level of expertise in special students is not of the level which could help them in effectively seeking and retaining a job.

Only 5% of the approximately one million deaf pupils in Pakistan attend a special school for the deaf. The number of pupils enrolled in school in Pakistan is organized like a pyramid, with fewer students at the highest levels. According to Batool et al. (2021) special schools for the deaf have a greater dropout rate than schools for hearing children.

Inability to obtain higher education inhibits HI's ability to enter a competitive employment market. According to Arsh et al. (2019), the Pakistani government has yet to meet the 2% quota for people with disabilities. Hearing-impaired persons and other people with disabilities (PWDs) in Pakistan rely on their families to meet their various requirements. Hearing impaired people see themselves as a burden on their families because of their needs. Consequently, they lose respect and honor, and they are not treated appropriately (Hussain et al., 2022). Working and studying in college, on the other hand, would be completely different for them. They would face strangers, unfamiliar surroundings, novel regulations, and furthermore, new

situations that they were not familiar with from their high school context, generating future career anxiety (Lersilp, 2006).

Today research is focusing their attention on the sources that cause anxiety and on the specific areas where anxiety becomes obvious and noticeable. Several subtypes of anxiety have been identified like academic anxiety, death anxiety, test anxiety (Luft, 2015). Various psychological tests are employed to measure anxiety as follows: The Taylor Manifest Anxiety Scale (TMAS), Beck's Self-report Anxiety Inventory (BAI) The State-Trait Anxiety Inventory (STAI), Hamilton Anxiety Rating Scale, and etc. For deaf students, literature review reveals only a few scales such as the Self-efficacy scale for the deaf (Marrie, 2005) and a three-dimensional anxiety scale regarding future education and career (Lersilp, 2006) that examined anxiety in deaf individuals. These scales have been developed according to the needs of western culture and cannot precisely tap the manifestation of anxiety in a collectivistic culture such as Pakistan where the educational system is different from the western educational system. A revision of the anxiety measures indicates in Pakistan, there are either modifications of external measures or they assess some specific forms of anxiety – Pakistan version of Social Anxiety Scale for adulthood (Bano & Ahmed, 2016; Ejaz et al., 2020).

Lane (1988) indicated that it is not suitable to administer scales developed for hearing individuals to deaf individuals because of standardization issues. The standards and norms for deaf and hearing populations are different based on cultural influences, this misleading and misinterpreted research finding. Regarding the mental health status of individuals with hearing impairment, the National Association for the Deaf (NAD) suggests a dire need for the generation of reliable and valid measures for hearing impaired. There are no scales specifically developed and validated for the appraisal of anxiety state in hearing-impaired individuals in the national cultural context. The researcher could not find any test to assess the anxiety levels of young deaf students in Pakistan. Therefore, development and validation of a standardized anxiety scale to assess the anxiety of young deaf students was targeted by the researcher with the following objectives:

1. To develop a Career Anxiety Scale for adolescents with hearing impairment.
2. To find out the reliability and validity of the Career Anxiety Scale for adolescents with hearing impairment.

Method

The study was descriptive in nature with cross-sectional research design to carry out the research. This study was conducted in three phases.

Phase-I: Generation of Items Pool

Phase-1 comprised generation of items pool and it has been completed into two steps.

Step-I: Literature Review

In the first step relevant literature and scales on the topic of carrier anxiety in youth as well as youth with special needs were studied. Further to explore the concepts, thoughts and perceptions of young hearing impaired individuals related to career, a list of open-ended questions was used to get the information. One hour discussion sessions for three consecutive days were done with twenty college and twenty school students. Their worries, thinking, feelings and understanding regarding career education were noted.

Step- II: Identification of Domains of Career Anxiety Scale

The following domain and dimensions of anxiety were identified:

Table 1
Domains and Dimensions Identified for the Career Anxiety Scale

Cognitive Manifestations	Psycho-Somatic Manifestations	Social Pressure
<ul style="list-style-type: none"> • Feeling Nervous • Excessive Worry • Restlessness • Negative Thinking • Feeling Helplessness • Lack of Interest • Memory Disturbances • Prediction of Failure • Self-De-grading thoughts • thinking they have forgotten everything • Thinking that they will be disappointing their family • Self- Efficiency • Pessimism thinks that disaster is always near and nothing is going right. • Worried about fulfilling other expectation • Poverty 	<ul style="list-style-type: none"> • Sweaty Palm, Rapid and Shallow heartbeat, hot flushes, nervousness and upset stomach • Restless • Increased fatigability • Difficulty in Concentrating • Irritability Tension • Sleep disturbance • Palpitation Sweating • Break Anxiety into Symptoms Physical (fast heartbeat), hot or sweaty, stomach problem, asks legs, hands) need to go toilet. Health-related anxiety or Somatic Symptoms. 	<ul style="list-style-type: none"> • Overestimate the level of threat • Underestimate their ability to handle, interactional fear of exploitation. • Anticipation increased the level of anxiety by thinking about an event or extant situation happen in the future. • Avoid social interactions. • Isolating. • Avoiding extra-curricular activities. • Inequity.

Step- III: Final Items Pool

A Pool of forty-nine items was generated under these dimensions i.e., cognitive manifestation comprised 17 items, 16 items in psycho-somatic manifestation, and social pressure comprised 16 items.

Phase-II: Content Validation of Career Anxiety Scale

Step-I: Establishing Content Validity

After item generation, the items were then arranged to check the relevance and clarity of the items regarding the measuring construct of the scales. The scales were then subjected to expert opinion. These experts were professionals in the field of psychology and special education area, which is hearing impairment. After expert opinion and suggestion total of forty-nine items of carrier anxiety scale for Hearing Impaired were reduced to forty-five items, whereas 4-terms were discarded. Career Anxiety Scale for Hearing Impaired was modified and organized on a five-point Likert scale, as per the recommendations of the experts. Five responses for each item starting from *Always* = 5, *Often* = 4, *Sometimes* = 3, *Rarely* = 2 and *Never* = 1.

Step-II: Empirical Evaluation of Scale

A sample comprising 44 female and 57 male students of age range between 16-25 years were selected randomly from Sir Syed academy for hearing impaired students, Rawalpindi for the pilot study. The reliability of the Career Anxiety Scale for Hearing Impaired Students was .889. Inter item-total correlation for the Career Anxiety Scale was computed. Inter Item total correlation shows that item number 3, 6, 12, and 14 under cognitive manifestation, item number 4 and 10 under psycho-somatic manifestation and item number 4, 6, and 12 under social Pressure, were weakly correlated ($r < .30$) with the total score on the Career Anxiety Scale for Hearing Impaired Students. Therefore, these items were discarded from the scale in the light of expert opinion (Cai et al., 2017). The resultant scale consisted of 35 items and the number of items pertaining to each dimension is as follows: 13 items in cognitive manifestation, 12 items in psycho-somatic manifestation, and 10 items in social pressure.

Phase-3: Empirical Validation of Career Anxiety Scale

In phase-3 empirical validation of career anxiety scale was done with help of exploratory factor analysis.

Sample

The population of the study was comprised of all hearing impaired students studying in secondary schools, higher secondary and graduation level, and age range between 16 to 25 years in the special education department in the province Punjab, Pakistan. The age range was chosen since this is the period when students must think about a career for the rest of their life. There were 9 divisions in the province of Punjab, Pakistan and in these divisions; there were 37 Government secondary schools and 7 Government degree colleges of special education for hearing impaired individuals. Because of the large geographical area of the province, Punjab, the cluster sampling technique was applied for the study to randomly select 2 secondary schools of the Government for hearing impaired students from all the 9 divisions of the province Punjab, Pakistan. In this study, all 5 Government degree colleges for special education were considered.

Table 2

Numbers of Divisions, Selected School, and Colleges Students Taken as Sample

Division	Number of Students from school		Number of Students from colleges	
	Male	Female	Male	Female
Gujranwala	34	16	0	0
Lahore	44	24	198	82
Rawalpindi	29	12	36	34
Multan	43	11	45	25
Sahiwal	46	25	0	0
Sargodha	43	07	0	0
Faisalabad	40	12	21	14
Dera Ghazi Khan	42	24	0	0
Bahawalpur	52	07	99	54
Total	373	140	399	209

Table 2 shows that a total of 513 students were selected from school and 373 students were males and 140 were female and the total number of hearing-impaired students studying in all five colleges was 608. Out of which 399 students were male and 209 were female. The total population of the study comprised 1121 students.

Procedure

The data from the schools and colleges in Rawalpindi division was collected by the researcher herself. The focal persons were selected from the schools and colleges of all other divisions of Punjab. They were explained about the purpose of the study and the required time duration. The data from these schools and colleges were collected with the help of the focal persons. After getting permission

from the authorities of the schools and colleges, CASH with descriptive sign language video was sent to focal persons through courier service. They were asked to read out the questionnaires carefully and take the response of students on each item after explaining each item in sign language with the help of teachers. Students were assured that their responses were kept confidential and used for research purposes only. A response rate of 75.56% (847 out of 1121) was attained because of constant reminders and requests to the selected focal persons from the researcher. Demographic information of the participants of the study is provided with the help of [Tables 3 and 4](#).

Table 3
Frequencies and Percentages of Demographic Variables (N=847)

Variables	Categories	Frequency (n)	Percentage (%)
Gender	Male	565	66.7
	Female	282	33.3
Student Age	16-19 years	428	50
	20-22 years	317	37
	23-25 years	102	12
Student class	9	192	22
	10	222	26
	11	140	16
	12	137	16
	13	80	9
Family Monthly Income	14	76	9
	5,000 to 20,000	441	48
	20,000 to 40,000	225	28
	40,000 to 60,000	160	18
	Above 60,000	31	3
Source of Monthly Income	Agriculture	101	11
	Jobs	296	34
	Business	148	17
	Labor	300	35
	No response	2	2

Table 4
Frequencies and Percentages of Levels of Hearing Impairment and Onset of Disability

Sr. No.	Categories	n	%
1	Levels of Hearing Impairment		
	• Mild	168	19
	• Moderate	124	14
	• Severe	242	28
2	• Profound	313	36
	Onset of the Disability		
	• By Birth	764	90
	• Accidental	83	9

Reliability of Career Anxiety Scale

For establishing reliability, Alpha reliability (.923), Split half reliability (.807), Parallel reliability (.923) and test-retest reliability (.830) were computed. All the values of reliability show that CASH was a reliable instrument. The test-retest gap in this research was one month. The sample was comprised of seventy-three students, of which twenty students were from the government secondary school for deaf boys Rawalpindi and fifty-three students were from govt. Degree College for special education, Rawalpindi.

Exploratory Factor Analysis for Construct Validity

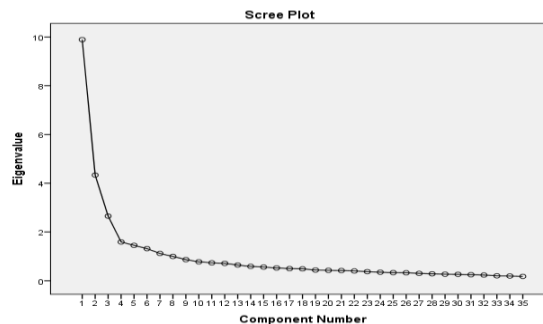
For establishing construct validity, factor analysis was done after items analysis. Results revealed that all items of scale were having corrected item-total correlation greater than .30 and the alpha reliability of all items was higher, so all items were retained.

To examine the factor analysis of the Career Anxiety Scale for hearing impaired students. Exploratory Factor analysis by Varimax rotation was done. 7 factors were extracted by scree plot and factor analysis, from which, one factor had contained three items and the other had more than three items in them, therefore, to well explained the items, the consultation from experts was taken. With their approval and agreement, the five-factor outcome was considered best. First, the Kaiser-Meyer-Olkin (KMO) along with Bartlett's Test of Sphericity were performed to check as if the data were suitable for the factor analysis. The value was 0.899 with significance level less than 0.01, which indicates that the size of the sample is proper for factor analysis.

Secondly, the scree plot was used to determine the number of dimensions to be chosen, seven in this case, as given below:

Figure 2

Scree Plot Showing Dimensions of the Career Anxiety Scale



The values of figure show that the scree plot representing seven dimensions/factors, afterward, there is a straight line having no significant change. In accordance with the consent and agreement of the experts, the above screen plot strengthened the five-factor solution.

Table 5
Factor Loadings of Career Anxiety Scale

#	Items #	Statement of the Items	Factor Loadings
Factor 1			
1	Item 14	Palpitations	0.69
2	Item 15	Headache	0.68
3	Item 16	Getting tired easily	0.74
4	Item 17	Stomach-ache or indigestion	0.73
5	Item 18	Blushing of face	0.71
6	Item 19	Laziness and lethargic	0.58
Factor 2			
7	Item 20	Feeling spasm in muscles	0.69
8	Item 21	Sweating	0.65
9	Item 22	Feeling uneasiness	0.83
10	Item 23	Difficulty in concentration	0.68
11	Item 24	Getting not interested in anything	0.74
12	Item 25	Get angry without any reason	0.53
Factor 3			
13	Item 29	Difficulty in getting a job due to the negative attitude of people	0.49
14	Item 31	Siblings may get a decent job, but you may not	0.74
15	Item 32	After getting fired may not regain a job	0.59
16	Item 33	Equal work of job but less pay	0.70
17	Item 34	The acquired job may not fulfill parents' expectations	0.77
18	Item 35	Feel hesitation for talking about a job with people	0.55
Factor 4			
19	Item 1	Fear of not getting job	0.65
20	Item 3	Job being lower than your education and skill	0.71
21	Item 4	Not getting a job on a handsome pay	0.72
22	Item 5	Not getting a job according to your interest	0.75
23	Item 7	No enough opportunities in getting a job as compared to general people	0.57
Factor 5			
24	Item 6	Not getting a job without any approach	0.65
25	Item 8	Fear of being unemployed forever	0.53
26	Item 10	Negative experiences of seniors about job	0.67
27	Item 11	Not getting proper guidance about job	0.67

Continued...

#	Items #	Statement of the Items	Factor Loadings
Factor 6			
28	Item 9	Not being able to show the best performance in the job	0.49
29	Item 26	To face tough competition in getting the job	0.58
30	Item 27	To work with general people	0.73
31	Item 28	Failure to develop friendship at work	0.57
32	Item 30	The boss may never feel happy or satisfied	0.52
Factor 7			
33	Item 2	Parents lack interest in your job	0.76
34	Item 12	Fear of not understanding impending changes in job	0.66
35	Item 13	Inability to understand the rules and regulation of job	0.58

The findings of [Table 5](#) present the factor loading of the 7 factors. As per the criterion, to retain items in each factor, loadings > .4 have been reported. The corresponding factor loadings on other factors below than .4 have not been reported. Further to see the Eigen values of each factor with their percentage of variance results are reported in [Table 6](#).

Table 6

Eigen Values, Percentage of Variance and Cumulative Percentage on Each Factor of Career Anxiety Scale

	Eigen Values	% Variance	Cumulative % Variance
Factor 1	9.89	28.26	28.26
Factor 2	4.33	12.38	40.64
Factor 3	2.65	7.57	48.22
Factor 4	1.59	4.54	52.76
Factor 5	1.45	4.14	56.91
Factor 6	1.31	3.76	60.68
Factor 7	1.11	3.19	63.87

Results presented in [Table 6](#) show Eigen values for all 7 factors. Similarly, results indicate the percentage of variance for the finalized factor. Percentage of variance for the first factor is 28.26 which are highest and overall cumulative percentage of variance for all factors is 63.87 for all seven factors.

Final Career Anxiety Scale

Content of items of each dimension was analyzed to recognize the common theme in them. The opinion of the experts was taken and with their consent and consensus, three new dimensions were created, and these were the Somatic manifestations, psychological manifestations, and workplace barriers. Some items of other

dimensions were also rearranged with the help of the opinion of the experts. Finally, 35 items comprising five dimensions i.e., cognitive manifestation (8 items), somatic manifestation (6 items), psychological manifestation (6 items), social pressure (9 items), and workplace barriers (6 items) were finalized in the scale:

Scoring and Interpretation of Norms for Anxiety levels on Scale

Total score is calculated by assigning a score of 1,2,3,4 and 5 to the response categories of *Never*, *Rarely*, *Sometimes*, *Often*, and *Always*, respectively and adding together the score for thirty-five items, with a total score range of 35 – 175. For the estimation of norms, the z-score was calculated for each raw score. After tabulating the z score of the total raw scores, the range of z scores split into three levels, in accordance with their matching raw scores, as given below:

Table 7

Standards of Interpretation of z scores

S #	Range of Raw Score	Range of Z-Score	Level of Anxiety
1.	120 and above	+0.51 and above	High Anxiety
2.	100 to 119	-0.50 to +0.50	Normal Anxiety
3.	99 and below	-0.51 and below	Low Anxiety

From the data, the number of individuals having various levels of anxiety was enlisted as presented in [Table 7](#).

Different Levels of Anxiety in Sample

The above finding shows that Hearing Impaired student population in high schools and Degree colleges in all over the Punjab Special Education Department have a great share of students suffering from an elevated level of Career anxiety (more than one-third). The Hearing Impaired students suffering from high anxiety ($n = 300$) demand attention, guidance, and counseling. Suitable intervention is desired to be designed, which is highly required to save their physical and mental health. Their educational achievement and social behavior may also suffer. The students with normal anxiety ($n = 305$) require to be motivated and are helped to keep their level of anxiety the same.

Convergent Validity of Career Anxiety Scale

To assess its convergent validity Undergraduate Students' Anxiety Scale and Hamilton Anxiety Rating Scale were used. Both

scales were translated into Urdu with the help of experts having expertise in English and Urdu language. For a better understanding of the medical terms, one general physician was also consulted. The findings show that undergraduate students' anxiety scale is significantly correlated (.314 at the 0.01 level). So, the newly constructed CASH measures the same construct, i.e., anxiety, and it is a valid scale. The findings indicate that the Hamilton Anxiety Rating Scale is significantly correlated (.259 at the 0.05 level). Therefore, the newly made CASH measures the same construct i.e., anxiety and it is a valid scale.

Discussion

This is the first piece of research from Pakistan to the best of our knowledge, which focuses on developing and validating a linguistically and culturally appropriate scale for future education and career anxiety, especially for hearing impaired students.

The Career Anxiety Scale for Hearing Impaired (CASH), a new five-point Likert scale, is developed and psychometrically evaluated in the study. The scale was created using a method of scale development that was methodical and advocated by [DeVellis \(2003\)](#), [Clark and Watson \(1995\)](#), and [Morgado et al. \(2017\)](#). According to [Boateng et al. \(2018\)](#), a sample size of more than 1000 people was ideal for developing a scale, therefore the researcher chose 1121 hearing-impaired students (373 male and 140 female) from eighteen high schools and five degree colleges in Punjab.

According to the HIS scores, a sizable portion of pupils (almost one third) suffer from severe worry about their future educational opportunities. These results corroborated those of [Jaschik \(2017\)](#), who found that the prevalence of anxiety disorders among students aged 18 to 26 had raised since 2008. [Bruce and Dabbab \(2020\)](#) discovered equivalent outcomes. They discovered that pupils with hearing loss were more anxious about their future profession than pupils with visual impairments. This is relevant given the nature of the disease, which limits the person's ability to communicate and makes it challenging for them to understand the speaker's message.

The current study found that three hundred hearing-impaired students who are genuinely concerned about their future career require aid, guidance, and counseling. Designing an appropriate solution is essential since it is important to maintain their physical and mental health. Their social connections as well as their academic performance can suffer. Children who experience typical anxiety need to be encouraged and supported to reduce career anxiety.

Conclusions

The study describes the development and psychometrics evaluation of a new five – point Likert scale, the Career Anxiety Scale for Hearing Impaired students. The results of the psychometrics analysis show that CASH had reasonable content validity, good internal consistency reliability, reasonable test re-test reliability and adequate concurrent validity that shows that the scale is reliable and valid and would be helpful in finding anxiety of hearing-impaired students regarding their career.

Limitations

The study's use of self-report measures, which are subject to bias, is one of its limitations. Self-reported responses could be exaggerated; respondents might be ashamed to divulge sensitive information; and other biases, such as the social desirability bias, might affect the findings. It would also be essential to include information from other evaluation methods outside self-report, such as observational data and physiological tests. Additionally, the researchers did not collect information on early educational experiences, such as the age at which kids started attending school and parenting practices. Deaf and hard of hearing students' educational experiences are known to vary widely, which may add to their concern about their long-term academic future.

Recommendation

With the idea that the development of CASH will stimulate or gather better knowledge about future career anxiety, leading to more accurate diagnoses and more effective intervention strategies, additional variations and refinement of these Scales are suggested. Moreover, to enhance these evaluation tools, more confirmatory research with a different or larger sample or a different grade level is necessary. Further, for comparing future career anxiety between hearing students and hearing-impaired students, more research is recommended.

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