

**ATTITUDE AND KNOWLEDGE OF TEACHERS ON INCLUSIVE
EDUCATION FOR CHILDREN WITH HEARING IMPAIRMENT-**

A SYSTEMATIC REVIEW

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(Audiology)

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SEPTEMBER 2021

CERTIFICATE

This is to certify that this dissertation entitled '**Attitude and Knowledge of Teachers on Inclusive Education for Children with Hearing Impairment - A Systematic Review**' is a bonafide work submitted in part fulfilment for degree of Master of Science (Audiology) of the student Registration Number: 19AUD039. This has been carried out under the guidance of faculty of the institute and has not been submitted earlier to any other University for the award of any other Diploma or Degree.

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September, 2021

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DECLARATION

This is to certify that this dissertation entitled '**Attitude and Knowledge of Teachers on Inclusive Education for Children with Hearing Impairment- A Systematic Review**' is the result of my own study under the guidance of Dr. Devi N, Associate professor, Department of Audiology, All India Institute of Speech and Hearing, Mysuru, and has not been submitted earlier to any other University for the award of any other Diploma or Degree.

Mysuru

September, 2021

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DEDICATION

Dedicating this work to Pavan Rao, my friend & a fighter of brain tumor,
and to all the schizophrenia warriors.

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"Feeling gratitude and not expressing it is like wrapping a present and not giving it." ~William Arthur Ward.

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ABSTRACT

Children with permanent hearing impairment suffer educational risks, and inclusive education was brought into action. Studies have reported that the practice of inclusive strategies lacked among the in-service teachers, time and resources for practice-focused training were not sufficient. Education infrastructure and resourcing were major challenges. The present study systematically reviews the literature between 2005 and 2020 to provide handy knowledge about the status of inclusive education for children with hearing impaired and teachers' knowledge and attitudes. A systematic review of full-length articles available in the English language was done. The studies employed questionnaires, in-depth interviews, observation for data collection. Individual studies were qualitatively analyzed using the CASP (Critical Appraisal Skills Programme) checklist for qualitative research to avoid the risk of bias. Out of 22 full-length articles, seven studies were included for the systematic review. Many factors were found to be affecting the teachers' attitudes about inclusive education, which are gender, teachers' qualification, years of teaching experience, level of teaching, which did not yield a generalized result. Special education training, parents' involvement, support from management played a major role in formulating teachers' opinions regarding inclusive education of the hearing impaired. Teachers' knowledge about hearing loss and its effects created an enormous impact on their attitudes. Teachers with adequate knowledge about hearing loss were more positive about inclusive education and vice versa. To provide a barrier-free inclusive education for students with hearing impairment in mainstream schools, the teachers, the management, and parents of the hearing impairment should be educated and oriented regarding inclusiveness. It is necessary to provide and help teachers to have a positive percept regarding the same. It,

therefore, signifies the role of educational audiologists in counseling the different personnel involved in inclusive education.

CHAPTER 1

INTRODUCTION

Hearing loss affects a child's potential to develop language, speech, and social skills, reflecting on their academic performances. Hearing loss can be congenital or may be acquired in the later stages of one's life. It is estimated that out of 1000, 1 to 6 infants have a congenital hearing loss of varying degrees and, children with congenital hearing loss whose loss is progressive are discovered in the later stages of life (Fortnum, 1997; Kemper et al., 2000; Cunningham & Cox, 2003). As a result of hearing impairment, speech and language learning difficulties exist in children with compromised auditory systems. A direct relationship has been established between receptive, expressive language delays and the amount of hearing loss that co-exists (Shonweiler et al., 1998). Such delays are observed to be impacting a child's quality of life. Education is one of such affected skill sets, leading to disrupted academic behavior of the child due to the existing classroom situations. Albeit children with a greater amount of hearing impairment, ranging from severe to profound, have been studied to show academic difficulties, children with a lesser degree of hearing loss exhibit academic backlogging. Pupils with minimal hearing impairment were demonstrated to struggle with skills like attention, communication, language, reading, social and emotional function, and exhibit fatigue according to Richburg and Goldberg (2005). In addition to that, children who have mild hearing impairment are observed to have issues like, need for frequent repetition, inattentiveness, and inappropriate answers to instructions (Dodd-Murphy & Mamlin, 2002). In 2009, the annual report to Congress on implementing the Individuals with Disabilities Education Act (IDEA) showed that close to 87% of students with hearing impairment spend few hours of the day in a regular or mainstream classroom

(U.S. Department of Education, 2009). The listening needs of children with hearing impairment must be considered. They spend most of their days in classrooms with other normal hearing individuals in a typical school environment. Educational support is necessary for students with hearing impairments due to the possible academic difficulties in typical class set-up. Although IDEA assures that the children with hearing impairment be educated in the least restrictive environments, there have been some limitations in implementing them. For example, when a person with hearing impairment is put in a typical mainstream school, the acoustic environment does not favor the child's needs. It may hinder their speech perception in noisy situations, making it difficult to understand the classroom instructions leading to the child's withdrawal from classroom participation (Palmer, 1997). The noise made while other children are moving, talking, and other classroom noise may degrade the quality of acoustic signal reaching the students. These types of situations are difficult for all students, especially those with hearing impairment. In addition to these, classroom reverberations result in fatigue in students with hearing loss by making it difficult to listen in classrooms with a poor acoustic environment (Palmer, 1997).

According to World Health Organization (WHO, 2020), around 466 million people worldwide have disabling hearing loss, 34 million are children. Children who have permanent hearing loss are at educational risk. These children were initially placed in "special" segregated schools for primary education until acts like the Individuals with Disabilities Education Act (1975), No Child Left Behind (NCLB) were brought into order. This law helped mainstream children with hearing impairment in normal schools for a barrier-free inclusive education. A specially-abled student has the option to choose to be in full-time inclusion or part-time

inclusion. These students are exempted from standardized assessments used for the rest of the pupils. An inclusion system delivers a combination of general and special education systems, educating all the learners (Matlock, Fiedler, & Walsh, 2001). Inclusion, however, is not merely placing a student who requires special education in a regular education classroom. It requires the meaningful participation of specially-abled students in the curriculum of general education. To properly implement inclusion, it is very important to assess teacher's attitudes who impart regular education to the students. These teachers stand as pillars in the delivery system of inclusion. Their attitude towards the system decides whether the system successfully welcomes a specially-abled student with learning opportunities.

Educational practitioners, special educators, social workers, researchers, audiologists, amongst many, are claiming latently and unequivocally about the nature and the changes that are very necessary, which were referred to as *endpoints*. These *endpoints* would include classroom, fully accessible physical environments, curricular adaptations, design, optimization of resources to support teaching staff, development of professional learning communities (Carrington, Deppeler, & Moss, 2010).

Many studies have been carried out to examine the attitudes of teachers towards the inclusion system, which the results have put the professionals in a dilemma. Few teachers who have received training in special education have camouflaged the system into their regular curriculum with a positive attitude (Powers, 2002), and few teachers have remained negative about inclusive education (Reusen et al., 2001). The main reason for the latter is the teacher's knowledge of the equipment and strategies used for inclusion. Those who are versatile with different inclusion modalities have successfully moved forward in classroom

education. In contrast, those with little or no information on how to go about the system are struggling and have developed a negative attitude towards the system. Even the administrative systems of the schools play a major role in this as they are the ones to provide supportive equipment for teachers to merge well. Administrators must set guidelines and standards for teachers and hold them responsible for following the standards because children with disabilities have an equal opportunity for an appropriate education (McGraw, 1998). Olcay and Vuran (2015) reported on the problems faced by children with special needs in schools. The classes did not have the necessary arrangements to aid children with special needs in terms of content, product dimensions, and procedures. And also, it was observed that these classes had inappropriate behaviors like punishing the students instead of using reinforcements.

Furthermore, it was also noticed that these students were not encouraged to participate in co-curricular, social activities and did not receive the necessary support from their peers. Children sought more support from their family members due to the minimum expectations they had from school training. It was reported that inclusive strategies were lacking among the in-service teachers, time and resources for practice-focused training were insufficient, and education infrastructure and resourcing were a major challenge (Pinnock & Nicholls, 2012).

1.1 Teacher's Attitude and Experience

In-depth research has stated that positive and favorable attitudes of mainstream teachers towards inclusion are the major factors that affect the outcomes of successful inclusion in such educational placements (Avramidis & Norwich, 2002; Berryman, 1988; Gal et al., 2010; Hastings & Oakford, 2003; Hayes & Gunn,

1988; Jordan-Wilson & Silverman, 1991; Mastropieri & Scruggs, 2000; Pivik, McComas, & LaFlanne, 2002; Stanovich, 1994; Stanovich & Jordan, 1998). Teachers' skills such as openness, reception to new changes by adapting to new skills, who have the potential of giving self-feedback, and who are open for inculcating new changes to bring equality and social justice to all the students, have been noted as the key factors in the success of academic lives of students who have been included in mainstream classrooms (Blecker & Boakes, 2010; Fisher et al., 2003; Gal et al., 2010; Garmon, 2005). Key factors that determine the attitudes of teachers towards successful inclusion of students with hearing impairment have been listed out by few authors, and factors like age, gender, educational level, teaching experience, knowledge of disability, personal experience, or contacts with people with disabilities have proven to be favorable (Avramidis & Norwich, 2002; Center & Ward, 1987; Gal et al., 2010; Hastings & Graham, 1995; Parasuram, 2006). It was found that elementary school teachers were more positive about inclusion than high school teachers (Scruggs and Mastropieri, 1996). Reducing the class size, getting ample plan-time, and curriculum additions like faculty training for inclusion with additional support personnel are few environmental factors that favor the successful outcomes of inclusion of students with hearing impairment (Avramidis & Norwich, 2002; Center & Ward, 1987; Gal et al., 2010; Scruggs & Mastropieri, 1996). And on the other side, we have variables such as inadequate knowledge about disability and inclusion, stereotypes, misconceptions, or an unknown fear, frustration, anger, misunderstanding, resistance to new changes, and even refusal on the part of some teachers, which are identified as factors that shadow negative attitudes on teachers from including students with hearing impairment (Gal et al., 2010; Gans, 1987; Heiman, 2004; Parasuram, 2006; Siegal & Jausovec, 1994). Negative attitudes on

the part of teachers towards models of inclusive education have proven to decrease students' academic performances. They can lead to increased isolation of students with disabilities. Negative attitudes have also been recognized as the most difficult environmental hurdles to be removed (Gal et al., 2010). Avramidis and Norwich (2002) have shown that teachers who received additional training on including students with special needs as a part of their curriculum had less resistance and more favorable attitudes in teaching inclusion classrooms which did not come as a surprise.

1.2 Teacher's Skill and Knowledge Base

Fisher et al. (2003) elaborated that skills and knowledge fundamentals are required to effectively implementing inclusion models in classrooms. This entire array includes a wide spectrum that consists of theories of multiple intelligence and learning through cooperation, knowledge about multicultural education and its outcomes, implementing a variety of instructional techniques in a hierarchy of individual, small-group, and whole-group instruction, and the potential to change and adopt new teaching materials, curriculum objectives, and assessment tools. Fisher et al. (2003) reported two different skills that are essential for teachers for better co-ordination with their colleagues and professionals involved in inclusive education of students with hearing impairment, and effective collaborations clubbed with respectfully established communications with parents, other educators, and paraprofessionals with a vision to make appropriate decisions concerning needs of the students. These skills were considered the additional knowledge required and the basic fundamental knowledge in a teacher's interest. Marschark et al. (2011) conducted a systematic review on how the teachers' knowledge and educational

background affect hearing-impaired students' academic outcomes in inclusion classrooms. It was found that 50% of poor scholastic performance resulted from the inappropriate implementation of inclusion models in general classrooms. Teachers who lack experience in teaching children with hearing impairment were not successful in identifying the strengths and weaknesses of their students to tap on their specific needs. This leads to inefficient usage of students' cognitive strengths and already existing knowledge fundamentals in learning something new. According to Marschark et al. (2011), teachers who take a student-centered approach to teaching that considers students' cognitive gaps and strengths, rather than a more teacher-centered information transmission approach, help improve academic performance of students with hearing impairment.

Hence, it is necessary to bring together all the factors that affect the attitude and knowledge of teachers who teach students with hearing impairment in regular classrooms. This makes it easier for educational audiologists to chalk out the areas that require changes and lay out a framework in helping teachers develop a positive attitude towards inclusive education by providing them adequate knowledge accordingly.

1.3 Need of the study

The literature, as mentioned earlier, indicates how it is necessary to carry out a systematic review to compile the existing data for future reference. It is important to keep the data handy and presentable within a single form to make it easy for researchers and implementers to inculcate inclusive education effectively.

1.4 Aim

To review the attitude and knowledge of teachers towards inclusive education of students with hearing impairment

1.5 Research questions

The study attempts to answer the following research questions using questionnaires and other survey studies:

- What are the attitudes of teachers teaching an inclusion classroom?
- What is the level of knowledge of teachers about inclusion?
- What are the variables affecting the success of the inclusive education system?

CHAPTER 2

METHOD

The systematic review was carried out for peer-reviewed articles based on guidelines by the Preferred Reporting Items for Systematic Review and Meta-analyses statement (PRISMA statement) (Moher et al., 2009).

2.1 Information sources

Databases like Google Scholar, PubMed, Shodhganga, CINAHL, J-STAGE, Web of Science, Cochrane Library, Scopus were systematically searched to extract articles necessary for the review. Citation tracking and reference list and were sifted to identify other relevant studies to be added.

2.2 Article selection

2.2.1 Inclusive criteria

- Articles that dealt with the knowledge and attitudes of general education teachers teaching inclusion classrooms of students with hearing impairment were considered. If the teachers taught students with other and multiple disabilities, they were excluded from the study.
- Year: Studies that were published between 2005 and 2020 were considered for the review
- Language: Studies that were published in English were considered for the review.
- Accessibility: Articles whose full length were accessible only were included in the review

2.2.2 Exclusion criteria

- Articles with low methodological quality and language apart from English.
- Case reports, letters to editors, and editorials

2.3 Search strategy

The selection of the articles was done using the keywords, key terms, related search phrases, derivatives, and MeSH words relevant to the study were: “Attitude, knowledge of teachers,” “inclusion of the hearing impaired,” “deaf, hard of hearing.” These were combined using Boolean operators like ‘OR,’ ‘AND’, ‘NOT’. Keywords were adjusted across different databases to arrive at the required results.

2.4 Data management and selection process

The results were taken in .csv format onto an excel spreadsheet, and duplicates were removed. Mendeley desktop was used as reference manager for the further assistance of data search & title screening, abstract screening for inclusion. The short-listed abstracts were sought for full-length availability, and the available articles were retrieved for review.

2.5 Data collection process and data items

Data were extracted from the finalized full-length articles under the following headings: author(s), publication year, method, objectives, population, study design, tools used, results, and the implication of results.

2.6 Quality assessment

The individual studies were qualitatively analyzed using CASP (Critical Appraisal Skills Programme) (Marques-Carneiro et al., 2020) to avoid the risk of bias. The quality rating of each study was divided into three sections in three categories; yes/ no/ can't tell. There are a total of ten questions in the checklist. The findings have been shown in the result section in detail.

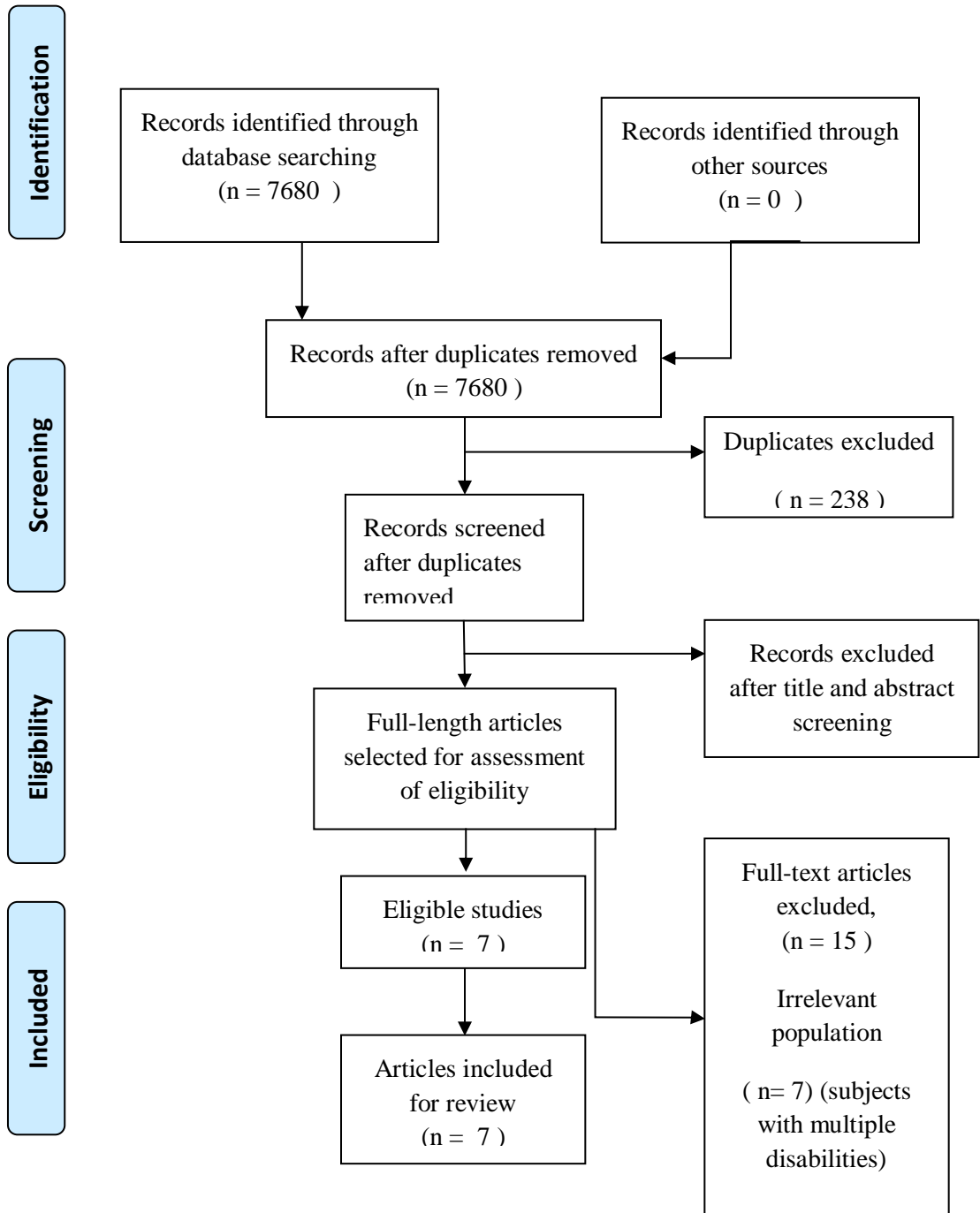
CHAPTER 3

RESULTS

The entire process of screening the articles has been depicted through the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) flowchart (Figure 3.1). A total of 7680 articles were screened after searching the databases like Google Scholar, PubMed, Shodhganga, CINAHL, J-STAGE, Web of Science, Cochrane Library, Scopus, 238 duplicates were found that demanded their removal, which led to a total of 7442 articles. 7420 articles had to be excluded after the title and abstract screening, which narrowed down the options for 22 articles for a full-length study. 22 full-length articles were assessed for their eligibility for the review. Out of which, seven studies were excluded as having an irrelevant population (persons with multiple disabilities), 8 were excluded as they incorporated irrelevant study designs that did not match our criteria for the review. A detailed PRISMA flow chart for the selection of the study is shown in Figure 3.1

Figure 3.1

PRISMA Flow Chart for the selection process of the article



3.1. Study characteristics

Table 3.1 summarizes the objectives, study design, specific tools used, results, and implications of each of the studies taken up for the review in the present study.

Of the 7 finalised studies, 1 article is from India, 1 study is based in Africa, 1 study is based in the Netherlands, 1 study is done in the classrooms of Turkey, 1 study is from Saudi Arabia, 1 study is done on the teachers of cities belonging to Canada, and the 7th study is done in the state of Ohio of the United States. These studies employed questionnaire surveys, postal surveys, focused and in-depth interviews, observation, etc.

After a full-length review of these 7 articles, few general factors were derived and identified to affect teachers' knowledge and attitudes, teaching students with hearing impairment in inclusion classrooms. Those factors can be studied under different headings which are discussed in chapter 4.

Table 3.1*Summary of the Studies Selected for Systematic Review*

Sl. no	Article Title	Author and year	Method	Objectives	Population (N)	Study design	Tools used	Results	Implications
1	Inclusion of Children with Hearing Impairment in Schools: A Survey on Teachers' Attitudes	Santhi S Prakash (2012)	Interview using questionnaire	To measure and compare the attitudes of teachers in regular schools towards the inclusion of Children with HI on 3 domains: Effective strategies for meeting the needs of all students The support in their district for educational change Inclusive education	100 regular school Teachers, Male = 50, Female = 50	Stratified sampling	A questionnaire by Galias and Tanner (1995) A 6 point Likert scale where, 6- strongly agree 1- strongly disagree	Management: Teachers working in government schools showed a more positive attitude towards inclusion. Gender: Female faculty showed more positive attitude as compared to male faculty, towards inclusion. Level of teaching: teachers who teach primary level children agreed more to the concept of	This study implies that teachers who receive a greater qualification in teaching perform well in teaching inclusion classrooms. Government and administration should provide ample resources to the teachers to help gain proficiency in tackling diversity in

				<p>With respect to factors like: Management Gender Level of teaching Experience of the teachers Qualification of the teachers</p>				<p>inclusive education than did the teachers who teach secondary level students.</p> <p>Experience of the teachers: Teachers who had more than 10 years of experience showed a more positive attitude towards inclusion than their colleagues with lesser years of experience.</p> <p>Qualification of the teachers: Teachers with higher qualifications showed a greater inclination towards inclusion than teachers with</p>	<p>their classroom settings.</p>
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								comparatively lesser qualifications.	
2	Experiences of Teachers of Deaf and Hard of Hearing Students in a Special Needs School: an Exploratory Study	Kayi Ntinda and S'Lungile Thwala (2019)	Qualitative exploratory research using focus group designs and individual in-depth interviews	What are the experiences of teachers who teach the deaf or HoH students in mainstream schools? Determine the strategies employed in teaching Identify the communication skills that existed between the deaf, Hoh students and the teachers Enumerate how teachers worked in collaboration	N= 18 Male= 11, Female= 07	Convenience sampling	Tape-recorded audio documents were transcribed and translated into English using African Scholarship Development Enterprise [ASDE], (2009).	9/11 (82%) lacked professional competencies to be able to teach the curriculum adapted by the mainstream 10/11 (91%) stressed an adaptation of the mainstream curriculum to cater to the learning needs of D/HH students	Teachers who teach deaf and hard of hearing students in mainstream schools lack professional competencies, due to which they lag in forming innovative ideas to teach such a population. Therefore, it is recommended to include deaf education training as part of the teachers training curriculum so that the

				with the parents of D/HH students in assisting them					teachers have adequate knowledge regarding how to develop skills in teaching a diverse population.
3	Mainstream Teachers about Including Deaf or Hard of Hearing Students	Jorine A. Vermeulen, Eddie Denessen, Harry Knoors (2012)	Interview	To what extent are the teachers practicing the planned differentiation resulting from including D/HH students in the mainstream curriculum? How is teachers' attitude towards inclusion related to their beliefs on self, self-efficacy,	9 teachers from 2 mainstream schools		The NVivo 8 (QSR International, 2008) software A checklist that had the following themes were used: Emotions of the teachers, teachers' behavior in the classroom, teachers' beliefs based on the three	Adaptive and positive attitudes when children behave in a non-deviant manner Unacceptable and not so positive attitude about inclusion of children into the mainstream curriculum because of their disruptive behavior in the classrooms	It is very important to instill a positive attitude in teachers teaching the deaf and hard of hearing students so that their beliefs in teaching such students are changed for good

				expectations on perceptions of others, and their emotions with respect to including D/HH students?			types described in Ajzen's theory of planned behaviour, teachers' background and characteristics of the educational setting		
4	The Influence of an In-Service Teacher Training (INSET) Programme on Attitude towards Inclusion by Regular Classroom Teachers who Teach	Hakan Sari (2007)	The experimental group was delivered with INSET lectures in 8 sessions for 8 days (once a week) which accounted for a total of 21 hours	To study the impact of an INSET program on teachers' attitudes towards mainstreaming deaf students into regular primary schools	N= 122 Experimental= 61 Control= 61	Quantitative research approach Randomized pre-test post-test design	Program of INSET courses based on the Deaf Friendly Teaching: Practical Guidance for Teachers Working with Deaf Children, The Opinions Relative to	Before taking up the INSET course, teachers expressed spectra of negative reviews in regards to their competency, self-efficacy in having classroom control for teaching the deaf, and they assumed that including children with special	Attitudes of teachers towards inclusion strengthened after INSET

	Deaf Students in Primary Schools in Turkey						Mainstreaming Survey, developed by Antonak and Larrivea (1995)	education needs were not their responsibility, and it was different teaching them. Overall responses of the experimental group teachers showed significant high numbers on the post-test than the control group	
6	Teachers' perceptions of the Inclusion of Children with Hearing Loss in General Education Settings	Alice Eriks-Brophy, JoAnne Whittingham (2013)	Qualitative exploratory research using the questionnaire	To document the attitudes of teachers who educate inclusive classrooms To check the extent of preparedness by teachers and the present level of support they	N= 63 Male= 15 Female= 46 Unknown gender= 2	Stratified sampling	A questionnaire which was developed based on the published literature related to teachers' knowledge, attitude, skills that have been	The study indicated that the teachers have strong support and attitudes toward inclusive education for students with hearing impairment. Variables like teaching experience, grade	An inclusive model for children with hearing loss stresses the requirement of teachers who not only have a positive attitude towards inclusive education but

				have been receiving, to effectively deal with children with hearing loss To study teachers' knowledge regarding the effects of hearing loss on language development, learning, and communication.			presented as fundamental keys to effective inclusion.	level, or the number of students with hearing impairment taught were shown to have no effects.	also acquire the basic knowledge on language development and effects of hearing loss on classroom behavior and learning
7	Survey on Knowledge and Attitudes of Hearing Loss and Assistive Listening Technology with Children	Danyelle Nicole Hayes, B.S (2014)	Qualitative Interview using the questionnaire	The frequency of mainstream teachers receiving education regarding hearing impairment and children with hearing impairment and the source	N= 134 K-8 grade teachers	Stratified and cluster sampling	Survey methods.com was used to generate a 35 items questionnaire	Study indicated that 75% of the surveyed teachers had personal experience with hearing impairment (eg.: friend, family members) 15% reported to have received	The results from this study could provide avenues for collaboration in the future between educators of children with hearing impairment and

				<p>of their information</p> <p>Familiarity of teachers with the aspects of hearing impairment and environmental modifications in a classroom that help in children with hearing impairment</p> <p>Teachers expressing their willingness to accommodate children with hearing impairment in their classrooms</p>				<p>formal education about hearing impairment</p> <p>91% expressed their willingness to include a child with hearing impairment</p> <p>7% said that they would be possibly willing</p> <p>2% were unsure of it</p>	<p>educational audiologists so that a supportive environment for their learning is given.</p> <p>With the support and guidance from educational audiologists, teachers can be given adequate knowledge and tools to support children with hearing impairment in general classrooms</p>
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3.2 Quality assessment

The individual studies were qualitatively analyzed using the CASP (Critical Appraisal Skills Programme) checklist for Qualitative research (Table 3.2) to avoid the risk of bias. The quality rating of each study was divided into three sections in three categories; yes/ no/ can't tell. There are a total of ten questions in the checklist.

The divisions made were,

Section A: Are the results of the study valid?

Section B: What are the results?

Section C: Will the results help locally?

The results of the quality assessment for all of the selected studies are provided in Table 3.2.

Table 3.2*CASP Checklist for Qualitative Research***Section A: Are the results valid?**

Sl. No.	Question	1	2	3	4	5	6	7
1	Was there a clear statement of the aims of the research?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	Is a qualitative methodology appropriate?	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Is it worth continuing?

Sl. No.	Question	1	2	3	4	5	6	7
3	Was the research design appropriate to address the aims of the research?	Yes	Yes	No	Yes	Yes	Yes	Yes
4	Was the recruitment strategy appropriate to the aims of the research?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5	Was the data collected in a way that addressed the research issue?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6	Has the relationship between researcher and participants been adequately considered?	Yes	Yes	Can't tell	Can't tell	Can't tell	Can't tell	Yes

Section B: What are the results?

Sl. No.	Question	1	2	3	4	5	6	7
7	Have ethical issues been taken into consideration?	Can't tell	Yes	Can't tell	Can't tell	Can't tell	Can't tell	Yes
8	Was the data analysis sufficiently rigorous?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
9	Is there a clear statement of findings?	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Section C: Will the results help locally?

Sl. No.	Question	1	2	3	4	5	6	7
10.	How valuable is the research?							
	Does the researcher discuss the contribution the study makes to existing knowledge or understanding?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Do they identify new areas where research is necessary?	Yes	Yes	Yes	No	Yes	Yes	Yes
	Have the researchers discussed whether or how the findings can be transferred to other populations?	Yes	Yes	Yes	No	Can't tell	Yes	Yes

Note: Numbers in the rows indicate the studies mentioned as against the same numbers in the table 3.1

On analysis as depicted in Table 3.2, it was found that all the studies were of good quality. Under section A, questions numbered 1, 2, 4, and 5 had 100% 'yes' responses indicating that there were clear statements of aims of the research, appropriate methodology, appropriate recruitment strategy, and appropriate way of data collection to address the research issue. Question number 3 had 85.71% 'yes' response indicating that 6/7 studies had employed appropriate research design, and 14.29% 'no' response. Question number 6 had 42.86% 'yes' response which indicated that a good relationship was established between researcher and participants in 3/7 studies, and 57.14% 'no' response which indicated that 4/7 articles did not state about the researcher- participant relationship. In section B, question numbers 8 and 9 had 100% 'yes' response which indicated that there were rigorously sufficient data analysis and clear statement of findings in all the 7 studies, question number 7 had 28.57% 'yes' response and 71.43% response fell under 'cant't tell', which lets us know that 5/7 articles taken up for review, have ambiguously mentioned about ethical considerations. In section C, part 1 of question 10 had 100% 'yes' response which says that all the 7 studies have discussed their contribution to existing knowledge, whereas the second part had 85.71% as 'yes' response and 14.29% response as 'no' indicating that 6/7 studies have identified and discussed the new areas of research. The third part of the question had 71.44% of 'yes' response, 14.28% had 'no' response and 14.28% as 'can't tell', which says that 5/7 studies have mentioned about the transfer of current findings to other population clearly whereas 1 out of 7 studies have not clearly mentioned

about the transfer of data and 1/7 studies gives us an ambiguous data of the same.

CHAPTER 4

DISCUSSION

This review tries to study the attitude and knowledge of teachers teaching mainstream curriculum to inclusive classrooms having students with hearing impairment.

Many factors have been identified as affecting the teachers' attitudes which include gender, qualification of teachers, level of teaching, teaching experience, special education training as a part of teachers' curriculum, professional competency, parents' cooperation, specialized needs of the students, management, willingness to work with students having an impairment, etc.

4.1 Gender

Female teachers were found to have more positive approach than did the male teachers, towards inclusive education (Prakash, 2012; Alasim & Paul, 2019). This was attributed to the fact that women have more emotional intelligence and are empathetic than men, and can adapt efficiently (Baron-Cohen, 2003). Contrastingly, there was no significant difference found between the attitudes of male and female teachers towards inclusion on the Opinion Relative to Integration of Student with Disabilities (ORI) scale (Antonak & Larrivee, 1995; Alasim & Paul, 2019).

4.2 Qualification of teachers

Teachers who had done Teachers' training course (TTC), Degree with B. Ed, Post-graduation with B. Ed were considered for the study and it was

found that teachers with higher levels of educational qualification, had more favourable attitudes towards an inclusive and barrier free education (Prakash, 2012). Teachers who have their Bachelor's degree and Post-graduation degree were surveyed and it was found that qualification of teachers did not significantly affect their attitudes on adapting inclusive education models (Alasim & Paul, 2019)

4.3 Level of teaching

Teachers teaching students at various primary and secondary levels were employed for the survey and it was brought to light that teachers who taught primary school students were more in the favour of inclusion as compared to teachers who taught secondary levels (Prakash, 2012) This was attributed to the fact that secondary school teachers were more concerned in subject matters and not much attention was paid to students with disability in the classroom. It was easy on primary school teachers as their focus was not much on subject-related matters (Cough & Lindsay, 1991). And as a paradox, no clear trend was established between teaching level and attitude of teachers teaching inclusive classrooms (Eriks-Brophy et al., 2013)

4.4 Teaching experience

Teachers who had less than 10 years and more than 10 years of teaching experience, were considered for the study. It was recognized that teachers who had an experience of teaching for more than 10 years were ready to accommodate students with hearing impairment well into the mainstream classrooms than the other teachers with less teaching experience. Explanation given to this observation was that with increased experience,

teachers' awareness towards disability and the influencing factors increased which could have led to a more positive attitudes in them (Prakash, 2012). Contrastingly, it was found that, number of years of teaching was found to have no correlation with attitude towards inclusive models (Alasim & Paul, 2019; Eriks-Brophy et al., 2013)

4.5 Special education teacher training as a part of one's training curriculum

A randomised pre-test, post- test design was taken for an experiment. Inservice Teacher Training (INSET) was given to an experimental group, and the control group was not given any training. Teachers who completed INSET were found to have positive opinions as found on 'Opinions Relative to Mainstreaming Scale' with regards to teaching inclusive classrooms of students with hearing impairment (Sari, 2007)

Teachers who attend teacher training programmes are well versed in teaching students with hearing impairment than the other teachers who do not attend the same (Ntinda et al., 2019). This has been unanimously agreed upon as a must pre requisite before placing teachers in work situations that require different, student-centric approaches, since it increases a teacher's readiness in accommodating students with hearing impairment into mainstream schools.

4.6 Professional competencies

The teachers of Eswatini special needs high school for the deaf reported in an in depth interview that 9/11 individuals (82%) were not

confident about having professional competency to teach mainstream curriculum to students with hearing impairment, as their teaching curriculum did not cover that part (Ntinda et al., 2019). This lack in professional competencies could be attributed to the fact that teachers contain no new creative and inventive methods to teach the mainstream curriculum to students with hearing impairment. This necessitates the adaptation of special training as a part of teachers' curriculum.

4.7 Parents' cooperation

The interview revealed that 100% of the teachers teaching inclusion classrooms felt the requirement of higher amount of parent participation in academic developments of their children (Ntinda et al., 2019; Vermeulen et al., 2012). Support from parents in grooming their children's scholastic performances is very necessary as parents know their children's needs very well, which can help guide the teachers in framing an approach that can suit their students appropriately. It has come to notice that parents rather take the burden off their shoulders by dropping their children off at school and later forget to follow them up (Vermeulen et al., 2012).

4.8 Specialized needs of the students

When students with hearing impairment were more heterogeneous with the other students of regular classrooms, teachers were not favourable for including such students and rather felt the need of special schools for such students instead of regular classrooms (Vermeulen et al., 2012).

4.9 Management

Teachers who work in government institutions were more open about inclusion as they had more access to support services like education resources, speech therapists, special educators, etc. (Prakash, 2012). Teachers also felt it is necessary that school's administration provide them with enough time and education materials to be better informed, so that they are ready to target the education needs of a student with hearing impairment in mainstream schools (Sari, 2007).

4.10 Knowledge of hearing loss

Increased knowledge about hearing loss can induce positive attitudes in teachers, about teaching inclusion classrooms. Having adequate knowledge about hearing loss, gave a versatile rostrum to adapt to the necessities that were on demand. Knowing about FM devices and other assistive listening devices made it easier for teachers to communicate with their hearing impaired students which resulted in a polished relationship between them. This led to teachers being more open about including students with hearing impairment into regular classrooms (Eriks-Brophy et al., 2013; Hayes, 2014) Teachers were of the opinion that inclusion of students with hearing impairment could be made more easy by providing them with the knowledge regarding hearing loss, amplification, etc. (Sari, 2007; Hayes, 2014). Knowledge on hearing impairment also has direct trends with teachers' willingness to work with students having impairment as they are more aware of hearing loss and the effects of varying degrees on

language learning and academic difficulties which makes them empathetic about their students.

Heterogeneous population of hearing impaired students increased the workload on teachers that demanded greater amount of time and attention which withheld teachers from being more open about including students with hearing impairment into regular classrooms.

4.11 Willingness to work with students having hearing impairment

Most of the respondents were willing to accommodate students with hearing impairment into mainstream classrooms and they were also positive about wearing assistive devices to aid the hearing impaired students' listening (Hayes, 2014).

Hence, these are the few factors affecting the attitudes and knowledge of teachers teaching hearing impaired students in inclusive education classrooms.

CHAPTER 5

SUMMARY AND CONCLUSION

The articles that have been reviewed have reflected that knowledge about hearing loss and other related aspects that thereby affect teachers' attitudes in including children with hearing impairment into mainstream classrooms. The review studies affirm the need for including special training as a part of teachers' training curriculum. Educational audiologists play a major role in educating teachers about hearing impairment and its ill effects on developing language, speech, and communication and its detrimental effects on scholastic performances. Teachers should have first-hand knowledge about rehabilitative and assistive listening devices and classroom strategies to make adjustments so that children with hearing impairment do not miss out on any classroom instructions or information.

It is also known that parents of children with hearing impairment do not participate actively in their children's academic activities. It is, therefore, necessary to counsel them about their roles and their significance in shaping their children's academic performances, which an educational audiologist can do.

It is not only the teachers but also the school management which is involved in providing a barrier-free education for students with hearing impairment at schools. Making the management aware of the lawful accommodations necessary for rightfully mainstreaming students with hearing impairment has to be done with the help of information given by educational audiologists.

Other factors that affect teachers' attitudes in including children with hearing impairment like gender, teachers' qualification level, years of teaching experience, level of teaching have failed to establish unanimous results as different studies report different findings. It is therefore known that these factors are individualistic and cannot be generalized.

Thus, this review emphasizes the role of audiologists in educating the teachers, parents, and school management about the disability and the coping strategies which can help change the teachers' attitudes towards adopting inclusive education models in teaching students with hearing impairment in mainstream schools.

5.1 Clinical Implication

- This review gives handy knowledge about the extent of inclusive education present in mainstream schools
- Through this, knowledge about areas that lack the favourable environment for inclusive education in a school, has increased which has also brought new factors under limelight
- This emphasizes the role of educational audiologists and also helps in guiding them about the factors that need to be considered while counseling and educating the personnel involved in inclusive education of students with hearing impairment
- The teachers can be counseled regarding modifications to help learn a specially-abled student better and suggest schools to bring up few modifications through legal measures.

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