Case Study 1: An Evidence-Based Practice Review Report

Theme: School/Setting Based Interventions for Social, Emotional and Mental Health.

How effective are group social skills interventions in improving the social competence of pupils with hearing impairment?

1. Summary

Social competence is an essential life skill needed to manage the social world and is linked to many positive outcomes (Prusnek et al., 2019; Spence, 2003). Research has shown that those with hearing impairment (HI) are more likely to have communication and speech difficulties leading to lower social competence (Hoffman et al., 2015). Lower social competence in those with HI is linked with poor mental health difficulties and peer issues (DeLuzio & Girolametto, 2011; Prusnek et al., 2019). One method of improving social competence is through group social skills training, which focuses on learning, practising and improving social skills with others. The current review included six studies which all implemented a group social skills intervention for pupils with HI. The overall findings show large effect sizes for all of these interventions, indicating that social skills training is an effective method of improving social competence in pupils with HI. The results should be taken with caution however, as the studies did have major methodological limitations which are discussed in detail in this paper. Recommendations for future research and for early intervention are also discussed as there is a concerning lack of research in this area, despite its importance.

2. Introduction

Social Competence

Children and young people need to be socially competent enough to be able to navigate their way through the social world and respond to a range of social situations on a daily basis (Spence, 2003). Social competence can be defined as a broad construct consisting of the social skills needed to effectively interact with those around you (Waters & Sroufe, 1983). Social skills can vary from fairly large characteristics like empathy, emotion management and cooperativeness to more specific actions such as turn taking, eye contact, and polite manners (Sugai & Lewis, 1996). Social competence is related to positive outcomes in health, well-being, employment and academia, and is seen as an important component in the prevention of many mental health difficulties (Carter et al., 2012; Prusnek et al., 2019; Spence, 2003).

Social skills training groups aim to improve social competence through various methods including problem-based learning, small group discussions, role-playing, social perspective taking, self-regulation training, and cognitive restructuring (Randi & Carvalho, 2013; Spence, 2003). High quality social skills training promotes active pupil learning and involvement, allows for opportunities of peer-assisted learning and relates learning to real-life experiences (Randi & Carvalho, 2013; Spence, 2003). Research has found substantial positive effects for social skills groups in the past, including in the domains of self-esteem (Seema & Kumar, 2018), peer relations (Roh et al., 2018), and for pupils with social or communication difficulties (Gates et al., 2017).

Hearing Impairment

Hearing impairment (HI) can occur in one or both ears and can be categorised into different levels in terms of their decibel hearing level; mild (21–40 dB), moderate (41–70 dB), severe (71–95 dB) and profound (95 dB) (NDCS, 2021). In March 2020, the World Health Organisation reported that roughly 466 million people worldwide have a recognised hearing loss, with 34 million of these being children, and that this figure is increasing. The causes of hearing loss vary but include conditions like glue ear or meningitis, birth complications, and genetic factors (NDCS, 2021; WHO, 2020). Those with HI are likely to experience difficulties in communication and interaction and preferred methods may include spoken language, lip-reading, sign language, or a mixture (Middleton et al, 2010).

There is no cure for HI but common treatment methods include hearing aids, cochlear implants, and bone conduction implants. Hearing aids are small electronic devices that are worn in the ear(s) and cochlear implants and bone conduction implants are surgically implanted (NDCS, 2021). Research on young people's perspectives has reported positive views around using cochlear implants through improving their awareness of sound and quality of interaction with others (Wheeler et al., 2007). Additionally, many people with HI feel a huge sense of pride around their deaf identity and of being part of the deaf community. This is especially so through their connections with other people with HI (McIlroy & Storbeck, 2011).

Psychological theory

Social skills training has psychological roots in Social Learning Theory (SLT; Bandura, 1997). SLT proposes that children learn how to behave through

observation and imitation of others around them. Other people act as models and can provide examples of how to behave in different situations. This is relevant for some of the methods of teaching seen in social skills training, such as modelling of appropriate behaviours and when practising imitation in role-play. Opportunities to practise appropriate social behaviours through role-play are particularly useful as they promote skill acquisition and development, especially if the situations role-played are relevant and meaningful to the individual's experiences in real-life (Spence, 2003). Furthermore, the feedback given and received in social skills training is likely to provide reinforcement to continue socially appropriate behaviours (Spence, 2003).

Both Vygotsky (1978) and Piaget's (1926) theories of child development also lend themselves to social skills training as both emphasise the importance of social interaction in cognitive development and learning. In social skills training, participation in group discussion and other cooperative activities is likely to result in learning through social interaction with peers and lead to better outcomes (Glynn et al., 2006; Randi & Carvalho, 2013). Peer-assisted learning can encourage pupils to make links to existing knowledge, cooperate and solve problems together, and support each other when understanding different social concepts (Glynn et al., 2006; Randi & Carvalho, 2013). Additionally, the variety of teaching methods in many social skills interventions promotes active participation and learning from pupils, allowing new knowledge to be consolidated in different ways (Randi & Carvalho, 2013).

Rationale and relevance

Pupils with HI often have poorer social competence and social skills than their normal hearing peers due to language delay and difficulties with communication and this can be a big barrier to social relationships (DeLuzio & Girolametto, 2011; Hoffman et al., 2015; Prusnek et al., 2019). Punch and Hyde (2011) outline 'social deafness', which describes the difficulties many people with HI have in social interactions with groups of people or in noisy environments. They found that children often struggled to hear and follow conversations in noisy situations, making school difficult socially. Punch and Hyde also found that pupils with HI tend to have lower awareness of social nuances or subtleties, meaning they were more likely to miss parts of conversations.

Research has shown that pupils with HI are more likely to be excluded or rejected by typically hearing peers and this can lead to lower levels of social interaction overall, further contributing to poorer development of social skills (DeLuzio & Girolametto, 2011). Other negative outcomes of these communication difficulties include poor mental health and wellbeing, increased emotional and behavioural difficulties, higher levels of self-consciousness, difficulties with friendships, and lower employment prospects (Carter et al., 2012; Prusnek et al., 2019; Punch & Hyde, 2011; Stevenson et al., 2015).

Educational Psychologists (EPs) are well placed in schools and have links with other professionals, making them key roles to develop strategies and interventions to support pupils with HI and to disseminate research to others. It is essential that social competence of pupils with HI is supported so that outcomes such as the ones listed above can be prevented. This review aims to address whether social skills interventions are effective in improve social competence in pupils with HI.

Research question

How effective are group social skills interventions in improving the social competence of pupils with hearing impairment?

3. Critical Review of the Evidence

Systematic Literature Search

A systematic literature search was conducted in January 2021 for electronic journals using five databases; PsycInfo, ERIC, Web of Science, ProQuest, and Google Scholar. PsycInfo was chosen for its focus on psychological research, ERIC was chosen for its focus on educational research, and the remaining three were chosen for their broader focus on a range of literature and subject areas. The terms used to search in these databases are shown in Table 1 below. The terms under 'Social', 'Hearing Impairment', and 'Intervention' were limited to the title only. The terms under 'Pupils' and 'School' could be anywhere in the text. In addition to these database searches, ancestral searches were performed.

Table 1

Search terms used based on key concepts of the research question

Social (Title only)	Hearing Impairment (Title only)	Intervention (Title only)	Pupils (Full text/all fields/anywhere)	School (Full text/all fields/anywhere)

Social OR Social Skills OR Social Competence OR Social Support	Hearing Impair* OR HI OR Deaf* OR Deaf Community OR Cochlear OR implant	Intervention OR Program* OR Strategy OR Training OR Group OR Treatment OR Therapy	Pupils OR Students Or Child* OR Young Person OR Adolescent OR Juvenile	School OR Educat* OR Class* OR Teach

Inclusion and Exclusion Criteria

Searching on the databases generated 93 studies. The ancestral searches, which were done to ensure all possible relevant studies were found, generated two articles. In total, the searches returned 95 results. 28 of these were removed due to duplication and a further 34 were removed when screened through the titles and abstracts. This left 33 studies which were screened through the full-text against the inclusion and exclusion criteria. The inclusion and exclusion criteria can be seen in Table 2. Twenty-seven studies were then removed due to the criteria which left six studies to be reviewed in this paper. Figure 1 shows a flow diagram of the systematic searching process explained above. Table 3 lists the references of the six chosen studies, and Appendix 1 provides the key features of each of them in a 'Mapping the Field' table. Appendix 2 provides a list of the 27 studies that were removed at full test screening.

Table 2
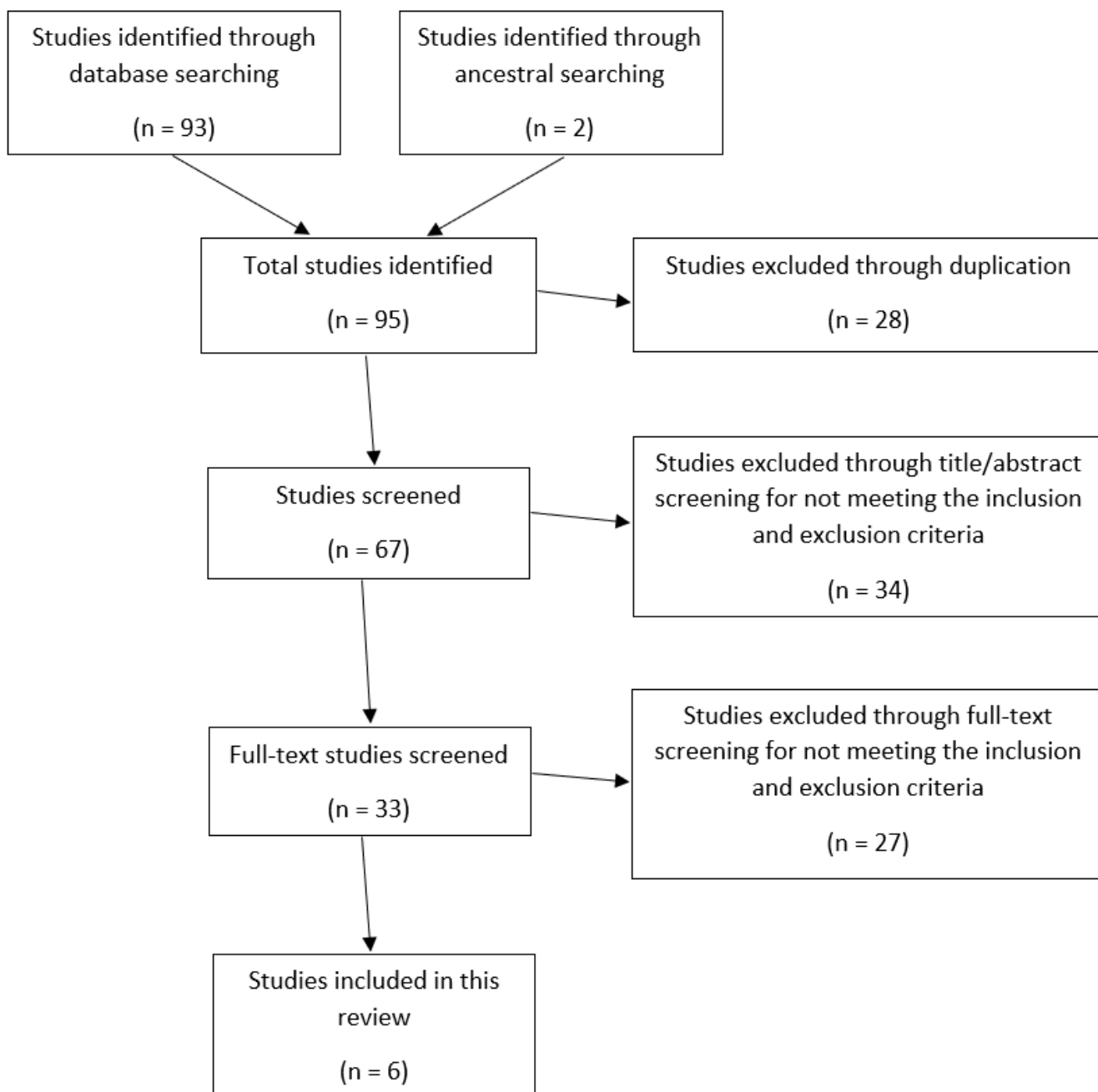
Inclusion and exclusion criteria

Criteria	Inclusion Criteria	Exclusion Criteria	Rationale

1. Population	At least one group in the study are pupils with a hearing impairment (this includes any kind of hearing impairment or deafness) Pupils enrolled in school (special or mainstream provisions)	No pupils with hearing impairments Pupils not enrolled in school.	The review question is focused on interventions that can be done in school settings with pupils with hearing impairments.
2. Outcome	Studies that include a measure of social competence/skill	Studies that did not include a measure of social competence/skill	The review question is focused on social competence as an outcome.
3. Intervention	Studies that focused on group training of social skills	Studies that were not group training of social skills	The review question is focused on group training interventions for social skills. Similarity between interventions support comparison between studies.
4. Publication Type	Published in a peer-reviewed journal	Not published in a peer-reviewed journal	Peer-reviewed journal studies have received a higher level of inspection and are therefore seen as higher quality scientific research.
5. Study Design	Experimental or quasi-experimental with pre and post test data.	Non-experimental studies without pre and post test data.	Studies with pre and post data are valid designs and allow the impact of intervention to be reviewed. Similar designs support comparisons between studies.
6. Publication Date	Published after 2000	Published before 2000	The majority of literature on hearing

			impairments is done before 2000. Research before 2000 was not included to ensure the studies are not outdated.
7. Language	Published in English	Published in a language that is not English.	The author's only language is English and therefore this ensures the author understands the content.

Figure 1

Flow diagram of study selection process

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┌─────────────────────────┐   ┌─────────────────────────┐
│ Studies identified       │   │ Studies identified       │
│ through database         │   │ through ancestral        │
│ searching                │   │ searching                │
│ (n = 93)                 │   │ (n = 2)                  │
└─────────────────────────┘   └─────────────────────────┘
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Studies identified through database searching (n = 93)

Studies identified through ancestral searching (n = 2)

Total studies identified (n = 95)

Studies excluded through duplication (n = 28)

Studies screened (n = 67)

Studies excluded through title/abstract screening for not meeting the inclusion and exclusion criteria (n = 34)

Full-text studies screened (n = 33)

Studies excluded through full-text screening for not meeting the inclusion and exclusion criteria (n = 27)

Studies included in this review (n = 6)

Studies in this review

Six studies met the inclusion and exclusion criteria and were selected for analysis. Table 3 below shows their full references.

Table 3

Full references of final studies
Adibsereshki, N., Vernosfaderani, A. M., & Movallali, G. (2015). The effectiveness of life skills training on enhancing the social skills of children with hearing impairments in inclusive schools. *Childhood Education, 469.*
Azizi, M., Saeidmanesh, M., Kazemi, F., & Radaie, V. (2019). The effectiveness of group counseling based on problem-solving on aggression and social adjustment in hearing-impaired students. *Auditory and Vestibular Research*, *28*(3), 164-172.
Movallali, Guita, and Abas Mahvashe-Wernosfaderani. (2014) The Effectiveness of Social Skill Training on Hearing Impaired Students. *Zahedan Journal of Research in Medical Sciences, 16* (9).
Naeini, T. S., Arshadi, F. K., Hatamizadeh, N., & Bakhshi, E. (2013). The effect of social skills training on perceived competence of female adolescents with deafness. *Iranian Red Crescent Medical Journal, 15*(12), 1-6.
Prusnek, L. L., Griffiths, T., & Provident, I. (2019). Implementing the comfortable cafeteria program to foster social participation of students with and without hearing impairments: A look at the outcomes. *Journal of Occupational Therapy, Schools, & Early Intervention*, *12*(2), 239-252.
Suárez, M. (2000). Promoting social competence in deaf students: The effect of an intervention program. *Journal of Deaf Studies and Deaf Education, 5*(4), 323.

Weight of Evidence

Gough's (2007) 'Weight of Evidence (WoE) Framework' was used in order to evaluate the extent to which each study contributed to answering the review question. The framework outlines three dimensions for which studies can be weighed against; WoE A, B and C. These three dimensions come together to produce WoE D, which rates the overall WoE of the study.

WoE A focuses on the methodological quality of each study. Gersten et al.'s (2005) coding protocol can be applied to group study designs and was therefore used in this review to assess WoE A of the four studies with that study design. An adapted version of the Gersten et al. protocol was used for the remaining two studies without a control group. See Appendix 3 and 4 for the protocols completed for each of the six studies. See Appendix 5 for the WoE A scoring.

WoE B focuses on the methodological relevance of each study, that is how relevant the study design is for answering the research question. Petticrew and Roberts' (2003) typology was used as it allows each study type to be assessed in relation to the review question. See Appendix 6 for the WoE B criteria.

WoE C focuses on topic relevance to the review question. Criterion was constructed for this review by the author and can be seen in Appendix 7.

Scores from WoE A, B and C were then averaged together to provide an overall weighting of the contribution and appropriateness of each study to the research question, known as WoE D. A breakdown of each WoE score and the overall WoE can be seen in table 4.

Table 4
WoE table

Study	WoE A	WoE B	WoE C	WoE D
Suárez (2000)	1	1	2.8	1.6 (medium)
Adibsereshki, Vernosfaderani & Movallali, (2015)	1	2	2.2	1.7 (medium)
Azizi, Saeidmanesh, Kazemi & Radaie (2019)	1	2	1.8	1.6 (medium)
Naeini, Arshadi, Hatamizadeh & Bakhshi (2013)	1	2	2.4	1.8 (medium)
Vernosfaderani & Movallli (2013)	1	2	2.2	1.7 (medium)
Prusnek, Griffiths & Provident (2019)	2	1	2.2	1.7 (medium)

Score descriptors: Low 1.4 or less, Medium 1.5-2.4, High 2.5 or above.

Participants

The total number of participants across the six studies in this review was 211, with 188 of those being described as having HI. Sample size of HI participants ranged from six (Prusnek et al., 2019) to 69 (Naeini et al., 2013). Degree of HI and details of the treatment of HI varied across the studies, covering all levels of HI. For example, Prusnek et al. (2019) described the use of hearing aids and cochlear implants. Details of the participants' HI given went towards the study's WoE A rating.

Four of the six studies reviewed took place in Iran, one took place in Spain and one in the USA. This review aims to be applicable to the UK education system and therefore WoE C ratings were scored according to the studies generalisability to the UK. With Iran being a non-OECD county, these studies were scored lower as Iran is likely to be an economically and socially dissimilar country to the UK. No study was scored the highest rating as none took place in the UK.

Ages of participants in this review ranged from five to 21 years. There were no age specific inclusion and exclusion criteria but all participants met the inclusion criteria through attending school, those over 18 were still attending a special school. Of the six studies, two recruited from mainstream (state) schools, two recruited from special schools, one recruited from those referred to speech therapy, and one recruited from 'exceptional' schools. All studies lacked in demographic information about participants, including socioeconomic status, ethnicity, or languages spoken.

Research design

Four of the studies were between participant designs with a control group and collection of pre and post-test data. Three of these had quasi-experimental designs and one had an experimental design. Two of these studies had a follow up collection of post-test data one month after the immediate post-test to determine if the impact of intervention would continue (Azizi et al., 2019; Vernosfaderani, 2013). This contributed towards the scoring in WoE A but was not enough to increase the total weighting in these studies. In these four studies, participants were randomly assigned to either the control or experimental group. Despite having a control group, all four studies did not provide any information as to what was involved in the control group and how it differed to the intervention group. This makes it difficult to interpret the impact of intervention as it is unclear what it is compared to. This lack of information was reflected in the coding for WoE A.

The two remaining studies used within-participant designs. They did have pre and post-data collection but not have a control group to compare the intervention group to. They instead had all participants take part in the intervention and reported changes in measures before and after. This makes interpretation difficult as it is unclear whether other factors occurring simultaneously are having an impact. This type of design is rated as a lower quality of evidence when reviewing effectiveness questions (Petticrew & Roberts, 2003) and is therefore reflected in the scores assigned in WoE B.

Intervention

This review question was concerned with group social skills training. All six studies involved training that focused on improving social skills and competence, however this did vary in a number of factors including type of training, topics covered, methods of teaching, setting of training, and number of training session.

Four studies in this review explicitly named their intervention 'social skills' training, the remaining two named their intervention 'life skills' and 'social problem-solving', although they all covered similar topics. Topics varied across the studies but many included problem-solving and decision making in social situations, managing different emotions, relationships and friendships, self-awareness, and conversational and communication skills. Training methods also varied but many began with time for teaching topic input and then involved adult modelling of social skills, roleplaying, group discussions, and giving and receiving feedback.

In three of the studies, researchers delivered the training, with two studies detailing how the researchers had training before the study around adapting their teaching for pupils with HI (Adibsereshki et al., 2015; Suárez, 2000). For example, exaggerating facial expressions, using gestures or sign language. Other trainers included Speech and Language professionals, Occupational Therapists, and Specialist Auditory Deficiency professionals.

The number of sessions varied across studies. Four studies ran above 10 sessions, with the highest running 21 sessions (Suárez, 2000). Two studies ran between five and 10 sessions and this was reflected in the WoE C scoring as being less likely to create a lasting impact, although it did not impact the overall WoE C descriptor.

Lastly, the setting of the intervention also varied and this was also measured in the WoE rating process due to the focus of this review question being on school-based interventions. Four studies were carried out in schools and therefore were given the highest mark for that WoE C criteria. Two studies were unclear in where the intervention was carried out and were therefore marked lower.

Measures

The review question was focused on measures of social competence. All of the studies in this review used different measures of social competence but they were all relevant to the review's focus. Every study conducted pre and post intervention data with their measure.

In four of the studies, self-report measures were used by the participants themselves. These included measures of social skills, social phobia, and perceived social and communicative competence. Two of the studies included teachers-report measures, looking at social skills. One study's measures were completed by the primary investigator only (Prusnek et al., 2019). Two of the six studies only used one form of measurement and this was noted by the WoE A coding protocol. Furthermore, many of the studies did not report sufficiently about measures of reliability and validity and this was noted when scoring for WoE A.

Findings

In order to directly compare findings across the studies, Cohen's d was produced using the means and standard deviations reported in the studies as it is a widely

used effect size in psychological research (Ladkens, 2013). Table 5 and 6 shows the effect size descriptors and the effect sizes of the reviewed studies. Effect sizes allow us to see the magnitude of an interventions impact and allow us to compare across studies where different measures have been used (Ladkens, 2013). In the four studies that were between-participant designs, effect sizes were produced using post-test data only comparing the intervention group to the control group. In the two within-participant designs, an effect size was produced through comparing the same groups pre-test data with post-test data. Five out of the six studies carried out a form of ANOVA, with four conducting an ANCOVA and one conducting a MANOVA. The remaining study reported mean point differences (Prusnek et al., 2019).

Only measures relevant to the outcome of social competence were included in the effect sizes which resulted in nine measures overall. Eight out of nine of these effect sizes came out as above 0.8 and were considered large, indicating that these interventions had a positive impact on measures of social competence or pupils with HI. One effect size for the Meadow/Kendall Social-Emotional Assessment Inventory for Deaf Students in Suárez' (2000) study came out at 0.3 and is therefore small. This was completed by teachers and measured three subscales; social adjustment, self-image, and emotional adjustment.

The largest effect size (-7.59, Vernosfaderani & Movallali, 2013) was negative due to the measure of social phobia, whereby a higher score relates to lower social competence. The other studies used measures of social skill ability whereby higher scores indicate higher social competence. Adibsereshki et al's (2015) study also produced a very strong effect size. Both of these studies also did follow up testing one month after the intervention ended, and both studies also reported continued positive impacts from their interventions.

There results should be interpreted with caution though as they have various methodological concerns and it is likely the effect size has been over estimated. The WoE A rating, which is focused on methodological quality of each study, is rated as low for five out of six studies, meaning they did not meet enough of the essential and desirable quality indicators from Gersten et al.'s (2005) protocol. With higher methodological rigour in these studies, including larger sample sizes and more measures, it is questionable whether they would have produced effect sizes this high. These issues are discussed in more detail in the conclusion section.

Table 5

Effect size descriptors

Effect Size	Descriptor
.8 or above	Large
.5	Medium
.2 or below	Small

Table 6

Effect sizes for studies in this review

Study	Sample Size (PP with HI)	Outcome measures	Effect Size & Descriptor	95% Confidence Intervals	Overall WoE D
Suárez (2000)	18	The MKSEAI (measures social and emotional adjustment and self-image)	0.30 (small)	-0.36 – 0.96	1.6 (medium)
		CABS (teacher report, measure of social skills)	0.83 (large)	0.14 – 1.50	
		CABS (self-report, measure of social skills)	0.9 (large)	0.62 – 2.06	
Adibsereshki, Vernosfaderani & Movallali, (2015)	44	SSRS (measure of social skills)	1.84 (large)	1.13 – 2.55	1.7 (medium)

Azizi, Saeidmanesh, Kazemi & Radaie (2019)	30	California Social Behaviour Inventory (measure of social adjustment)	1.26 (large)	0.47 – 2.04	1.6 (medium)
Naeini, Arshadi, Hatamizadeh and Bakhshi (2013)	69	Hearing Impaired Children Self-Image Test (socio-emotional competence)	1.00 (large)	0.50 – 1.51	1.8 (medium)
		Hearing Impaired Children Self-Image Test (communication competence)	1.08 (large)	1.89 – 1.13	
Vernosfaderani and Movallli (2013)	22	SPIN (measures social phobia and social skills)	- 7.59 (large)	-9.99 – -5.20	1.7 (medium)
Prusnek, Griffiths and Provident (2019)	5	Social Profile: Children's Version	0.87 (large)	-.044 – 2.15	1.7 (medium)

4. Conclusion

This systematic literature review aimed to evaluate the effectiveness of group social skills interventions on improving the social competence of pupils with HI. Social competence is an essential part of navigating our social world and is related to a range of positive outcomes (Spence, 2003). Due to issues with communication and speech, people with HI are more likely to have lower social competence and this can lead to poorer life outcomes such as peer rejection and poor mental health (Hoffman et al., 2015; Punch & Hyde, 2011). Six studies were included in this review, all of which implemented group social skills training for pupils with HI. Shared features of the training included group discussion time, role-playing activities, adult modelling, and feedback to and from peers. All six studies reported positive results with large effects for the impact of their social skills intervention on various measures of social competence. This indicates that social skills interventions are an effective method of improving the social skills of pupils with HI.

However, these results must be taken with caution and no conclusive statements can be made based on these studies alone. Five out of the six studies were rated low for methodological quality (WoE A) using the Gersten et al. (2005) coding protocol. A key methodological issue was the low samples sizes for the studies, meaning that they were likely underpowered and could contribute to the inflated effect sizes that are reported. The two studies with the highest samples size had 69 (Naeini et al., 2015) and 44 (Adibsereshki et al., 2015) participants and the lowest had only five participants with HI (Prusnek et al., 2019). Another limitation was that two of the studies (Prusnek et al., 2019; Suárez 2000) did not have control groups to compare the intervention impact too. The remaining four studies with a control group, did not provide detail about what was involved in the control group and therefore

meaningful comparisons cannot be drawn. Without information about the control group, it is unclear what specific factors led to the positive results in the intervention groups as we don't know what each group experienced. Related to this, there was also a general lack of detail in all studies about in how the interventions were carried out which meant it would be difficult to replicate them in future. Lastly, a limitation of this systematic review overall is that the studies did not test the same exact interventions and they did not use the same measures. This makes comparison slightly less straightforward but still very valuable as the interventions had similar features and a shared goal.

Recommendations

To the authors knowledge, this was the first systematic literature review into the effectiveness of group social skills interventions on social competence of pupils with HI. When conducting the systematic search, it was evident that there is very limited research in this topic area. Considering the positive effects found in this review but the low methodological quality of the studies, there is a need for further, higher quality research in this area. It is recommended that future research should have larger and more representative samples as the samples found in this review were quite dissimilar to the UK, making it difficult to generalise to the UK education system. Future research could also look into the specific features or topics of social skills training that might contribute to increased social competence. In this review, the interventions differed and tended to be undetailed in the information given. It is therefore unclear around what exact features were most helpful. Furthermore, two studies in this review did conduct follow up measures one month on but more

research is needed assess the longer-term impact of social skills interventions as it is unclear how long the positive effects lasted.

The results of this review are important to EP practise as they highlight the vulnerability of HI pupil in terms of social skills and emphasise the need for early intervention. Early intervention for pupils with HI has been shown to result in significantly greater outcomes in language, speech and social-emotional development (Yoshinage-Itano, 2003). EPs also have a role in disseminating research to schools and families through training, promoting awareness, and through offering supervision and guidance. Additionally, many of the studies in this review incorporated various professionals to develop and run the interventions (Azizi et al., 2019; Prusnek et al., 2019; Suárez, 2000). This highlights the importance of multiagency working and EPs should have the opportunity to collaborate with other professionals when supporting pupils with HI. The studies in this review have indicated that group social skill training can support the social competence of pupils with HI. With the prevalence of HI predicted to continue to increase (NDCS, 2021), it is essential that EPs work to research this area further and provide support to these vulnerable pupils.

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Spence, S. H. (2003). Social skills training with children and young people: Theory, evidence and practice. *Child and adolescent mental health*, *8*(2), 84-96.

Stevenson, J., Kreppner, J., Pimperton, H., Worsfold, S., & Kennedy, C. (2015). Emotional and behavioural difficulties in children and adolescents with hearing impairment: a systematic review and meta-analysis. *European child & adolescent psychiatry*, *24*(5), 477-496.

Sugai, G., & Lewis, T. J. (1996). Preferred and promising practices for social skills instruction. Focus on Exceptional Children, 29, 1-14.

Vygotsky, L. S. (1978). Mind and society: The development of higher psychological processes. Cambridge, MA: Harvard Press

Waters, E., & Sroufe, L. A. (1983). Social competence as a developmental construct. *Developmental review*, *3*(1), 79-97.

Wheeler, A., Archbold, S., Gregory, S., & Skipp, A. (2007). Cochlear implants: The young people's perspective. *Journal of Deaf Studies and Deaf Education*, *12*(3), 303-316.

World Health Organisation (2020). Deafness and Hearing Loss. Retrieved from: https://www.who.int/news-room/fact-sheets/detail/deafness-and-hearing-loss

Yoshinaga-Itano, C. (2003). From screening to early identification and intervention: Discovering predictors to successful outcomes for children with significant hearing loss. *Journal of deaf studies and deaf education*, *8*(1), 11-30.

Appendices

Appendix 1

Mapping the Field

Study and Location	Study Design	Participants	Intervention	Measures
Suárez (2000) 3 state schools from Tenerife (2) and Gran Canaria (1). Described as having preferential integration of deaf students.	Quasi-experimental Pre and Post test data No control group	36 participants overall. 18 participants were either profoundly or severely deaf. This included 10 females and 8 males ranging from age 9;1 to 13:6. 18 participants had normal hearing. Gender and specific ages not reported. Described as being of similar ages to the HI group.	Two parts: 1) An interpersonal problem-solving training program focussing on the cognitive skills needed in social situations. 20 1-hour sessions to teach 15 lessons. Taught only to the HI pupils. groups of 3 or 4. Carried out in pupil's school in the lunch break. 2) A social skills training program. 6 1-hour sessions. Taught to the HI and normal hearing pupils. same groups of HI before together with normal hearing companions. Across both parts, topics included social problem solving, cognitive thinking skills and perspective taking,	A session diary kept by the program instructors recording pupil's responses to social situations. The Meadow/Kendall Social-Emotional Assessment Inventory for Deaf Students (MKSEAI; Meadow, 1983) – completed by teachers. Measures social adjustment, self-image, and emotional adjustment. It has been standardised for deaf students. Children's Assertive Behaviour Scale (CABS, Michelson et al., 1983) completed by regular teacher and HI teacher together. HI pupils completed the self-report form. Presents social situations and measures

			managing emotions, and cooperation.	expression and reception of various social skills.
			Methods of training included modelling, roleplaying, giving feedback, and discussions.	The Cuestionario Sociometico (Gosablez, 1980) completed by classmates. Measured the social status of the HI pupils.
			Delivered by the researcher and a Specialist for Auditory Deficiency. Both adapted their teaching for pupils with HI.	
			Training was carried out in the school environment.	
Adibsereshki, Vernosfaderani & Movallali, (2015) Arak, Iran	Experimental design. Pre and post test data Use of control groups	44 participants overall. Aged 12 to 16, all male, all had hearing impairments ranging from mild to moderate hearing loss. Most used hearing aids. Randomly assigned to either an experimental group (24 students) or control group (20 students)	The experimental group received 14 sessions of 'life skills' training twice a week for 7 weeks, lasting 2 hours each. Topics included social decision making, communication, thinking skills, managing emotions, and relationships. Methods of training included lecturing, role modelling, discussions, and activities.	The Social Skills Rating Scale (SSRS, Gresham & Elliot, 1990). Teacher form was used. This measured behaviour impacting relations with others and peer acceptance. Follow up 1 month after the post-test

			Delivered by an instructor who had been trained to teach pupils with HI. . Unclear in which setting the intervention was done.	
Azizi, Saeidmanesh, Kazemi & Radaie (2019) Yazd City, Iran	Quasi-experimental Pre and post data Use of control group	30 adolescents (who rated high for aggression and low for social adjustment). 15 in experimental, 15 in control. 14-18 years old. All male. All with moderate or mild hearing impairments and used hearing aids.	Social problem-solving training sessions occurred once a week for two hours by a psychologist and speech therapist. 7 weeks. Topics included social problem-solving and generalisation to other situations. Methods of training included role play and PowerPoint presentations. Delivered by a Psychologist and a Speech Therapist. Unclear in which setting the intervention was done.	California Social Behaviour Inventory (Clark et al., 1953). Measures social adjustment – social skills, relationships. Aggression questionnaire (Buss and Perry, 1992)

Naeini, Arshadi, Hatamizadeh & Bakhshi (2013) Tehran, Iran	Quasi-experimental Pre and post data Use of control group	69 females with severe or profound deafness. Across 4 specialist secondary schools. 2 schools were the experiment (33 students) and 2 schools were control (26). In grades 6-8 but age ranged from 11-21.	12 60 minute bi-weekly sessions. Topics included friendships, managing emotions, and self-awareness. Methods of training included teaching input, roleplay and discussions. It was unclear who delivered the intervention. Training was carried out in the school environment.	The Hearing-Impaired Children Self-Image Test. Measured feelings around their own socio-emotional competence (and cognitive, physical and communication)
Vernosfaderani & Movallli (2013) Arak, Iran	Semi-experimental Pre and post data Use of control group	Moderate hearing impairment, 8-18. 22 pupils who received high scores on a social phobia inventory. Randomly assigned experimental or control.	Social skills training twice a week. Sessions lasted 2 months, sessions done by a researcher at the school. Topics included conversation skills, assertiveness, verbal and non-verbal interactions. Methods of training included direct instruction, modelling, role playing and feedback.	Social phobia inventory done before and after (Davidson). Measures fear, avoidance and physiological distress components of social anxiety. The Leiter International Performance Scale (Leiter, 1927) was used to measure intelligence. Follow up 1 month on.

			Delivered by a researcher at the school. Training was carried out in the school environment.	
Prusnek, Griffiths & Provident (2019) Ohio/Pennsylvania, USA	Mixed-methods approach Pre and post test data	Attended elementary school with has HI program within it. 10 pupils included in the sample, 5 with HI moderate to profound. Three wore cochlear implants and one wore hearing aids. 5 without matched for age and sex. 30 other pupils were part of the intervention but data was not collected on them. 6 girls and 4 boys, 5:3-8:2.	Comfortable Cafeteria program – a social skills training intervention established program created by OTs. Occurred for 6 weeks, once a week at lunch time for 20 mins, delivered by student researchers delivered. Methods of teaching included coaching, activities, and various resources. Delivered by Occupational Therapists. Training was carried out in the school environment.	Social Profile: Children's Version (Donohue, 2013). Measure social skills. Includes the evaluator to observe the participants and answer statements based on it in activity pp, social interaction and group membership. Open and closed questions. Created a survey to measure the research assistant's perception of the effectiveness of intervention.

Appendix 2

List of studies excluded at full text review and the related exclusion criteria.

Excluded Study Reference	Exclusion Criteria
Ademokoya, J. A., & Olujide, M. G. (2007). Typology and interventions for some social problems affecting the learning of the hearing-impaired child. *International Journal of Rehabilitation Research, 30*(1), 75. Retrieved from https://search-proquest-com.libproxy.ucl.ac.uk/scholarly-journals/typology-interventions-some-social-problems/docview/205851733/se-2?accountid=14511	5. Study Design
Antia, S. D., & Kreimeyer, K. H. (1987). The effect of social skill training on the peer interaction of preschool hearing-impaired children. *Journal of the Division for Early Childhood, 11*(3), 206-216. doi:http://dx.doi.org.libproxy.ucl.ac.uk/10.1177/105381518701100302	6. Publication Date
Antia, S. D., & Kreimeyer, K. H. (1996). Social interaction and acceptance of deaf or hard-of-hearing children and their peers: A comparison of social-skills and familiarity-based interventions. *Volta Review, 98*(4), 157-80. Retrieved from https://search-proquest-com.libproxy.ucl.ac.uk/scholarly-journals/social-interaction-acceptance-deaf-hard-hearing/docview/62503158/se-2?accountid=14511	6. Publication Date
Avcioglu, H. (2007). Examining the effectiveness of a program developed for teaching social skills to hearing impaired students based on cooperative learning. *Kuram Ve Uygulamada Egitim Bilimleri, 7*(1), 340-347. Retrieved from https://search-proquest-com.libproxy.ucl.ac.uk/scholarly-journals/examining-effectiveness-program-developed/docview/236993877/se-2?accountid=14511	5. Study Design
Barimani, S., Asadi, J., & Khajevand, A. (2018). A comparison between the effectiveness of game therapy and emotional intelligence training on social compatibility and communicative skills of exceptional primary school hyperactive and deaf children. *International Journal of Pediatrics, 6*(5), 7653-7666.	3. Intervention

Calderon, Rosemary & Greenberg, Mark T. (2003). Social and emotional development of deaf children: Family, school, and program effects. Marschark, Marc [Ed], Spencer, Patricia Elizabeth [Ed]. Oxford handbook of deaf studies, language, and education. New York, NY, US: Oxford University Press, US; pp. 177-189. Retrieved from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=psyc4&NEWS=N&AN=2003-00548-013.	5. Study Design
Calderon, Rosemary & Greenberg, Mark. (2011). Social and emotional development of deaf children: Family, school, and program effects. Marschark, Marc [Ed], Spencer, Patricia Elizabeth [Ed]. The Oxford handbook of deaf studies, language, and education., Vol. 1, 2nd ed. New York, NY, US: Oxford University Press, US; pp. 188-199. Retrieved from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=psyc8&NEWS=N&AN=2013-01233-013.	5. Study Design
Ducharme, D. E., & Holborn, S. W. (1997). Programming generalization of social skills in preschool children with hearing impairments. *Journal of Applied Behavior Analysis, 30*(4), 639-51. Retrieved from https://search-proquest-com.libproxy.ucl.ac.uk/scholarly-journals/programming-generalization-social-skills/docview/225059161/se-2?accountid=14511	6. Publication Date
Fellinger, Johannes & Holzinger, Daniel. (2015). Social relations, mental health, and deaf learners: Approaches to intervention. Knoors, Harry [Ed], Marschark, Marc [Ed]. Educating deaf learners: Creating a global evidence base. New York, NY, US: Oxford University Press, US; pp. 389-411. Retrieved from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=psyc12&NEWS=N&AN=2015-29053-017.	5. Study Design
Gage, S., & Others, A. (1994). A social learning program for deaf adolescents. *Perspectives in Education and Deafness, 13*(2), 2-5. Retrieved from https://search-proquest-com.libproxy.ucl.ac.uk/scholarly-journals/social-learning-program-deaf-adolescents/docview/62719095/se-2?accountid=14511	6. Publication Date
Hansmann, Sandra, Saladin, Shawn P & Quintero, Sonia. (2011). Development of social learning program for students in undergraduate deaf rehabilitation program. Journal of the American Deafness and Rehabilitation	5. Study Design

Association, 44(3), 106-115. Retrieved from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=psyc8&NEWS=N&AN=2012-34586-001.	
Ladd, Gary W, Munson, Harold L & Miller, John K. (1984). Social integration of deaf adolescents in secondary-level mainstreamed programs. Exceptional Children, 50(5), 420-428. Retrieved from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=psyc2&NEWS=N&AN=1984-13442-001.	6. Publication Date
Lemanek, Kathleen L & Gresham, Frank M. (1984). Social skills training with a deaf adolescent: Implications for placement and programming. School Psychology Review, 13(3), 385-390. Retrieved from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=psyc2&NEWS=N&AN=1985-04729-001.	6. Publication Date
Luckner, J. L., & Movahedazarhouligh, S. (2019). Social–emotional interventions with children and youth who are deaf or hard of hearing: A research synthesis. *The Journal of Deaf Studies and Deaf Education*, *24*(1), 1-10.	5. Study Design
Luetke-Stahlman, B. (1995). Social interaction: Assessment and intervention with regard to students who are deaf. *American Annals of the Deaf, 140*(3), 295-303. Retrieved from https://search-proquest-com.libproxy.ucl.ac.uk/scholarly-journals/social-interaction-assessment-intervention-with/docview/214470564/se-2?accountid=1451	6. Publication Date
Lytle, Richard R. (1987). The effects of a cognitive social skills training procedure with deaf male adolescents. Dissertation Abstracts International, 47(11-B), 4675. Retrieved from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=psyc3&NEWS=N&AN=1988-52368-001.	6. Publication Date
Martin-Laval, Henri M. (1983). The training of social skills in deaf adolescents: II. Behavioral changes, generalization, and attitude changes. Revue de Modification du Comportement, 13(1), 1-14. Retrieved from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=psyc2&NEWS=N&AN=1984-02573-001.	6. Publication Date

Masciola, C. (1999, Sep 08). Some deaf people see implants as a threat to their way of life SOCIAL ISSUES: Many say they have no need of `fixing' through surgery and extended hearing therapy.: [MORNING edition]. *Orange County Register* Retrieved from https://search-proquest-com.libproxy.ucl.ac.uk/newspapers/some-deaf-people-see-implants-as-threat-their-way/docview/273216712/se-2?accountid=14511	6. Publication Date
Monaghan, Christy L. (2005). The effects of social skills training on peer interactions among elementary-age children with hearing impairment. Dissertation Abstracts International: Section B: The Sciences and Engineering, 65(10-B), 5414. Retrieved from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=psyc4&NEWS=N&AN=2005-99008-099.	4. Publication Type
Monshizadeh, L., Vameghi, R., Sajedi, F., Yadegari, F., Hashemi, S. B., Kirchem, P., & Kasbi, F. (2018). Comparison of social interaction between cochlear-implanted children with normal intelligence undergoing auditory verbal therapy and normal-hearing children: A pilot study: MJO. *The Journal of International Advanced Otology, 14*(1), 34-38. doi:http://dx.doi.org.libproxy.ucl.ac.uk/10.5152/iao.2018.3663	3. Intervention
Movallali, G., Jalil-Abkenar, S. S., & A'shouri, M. (2015). The efficacy of group play therapy on the social skills of pre-school hearing-impaired children. *Archives of rehabilitation, 16*(1), 76-85.	3. Intervention
Rasing, Eef J & Duker, Pieter C. (1992). Effects of a multifaceted training procedure on the acquisition and generalization of social behaviors in language-disabled deaf children. Journal of Applied Behavior Analysis, 25, 723-734. https://doi.org/10.1901/jaba.1992.25-723	6. Publication Date
Richels, Corrin, Bobzien, Jonna, Raver, Sharon A, Schwartz, Kathryn, Hester, Peggy & Reed, Lauren. (2014). Teaching emotion words using social stories and created experiences in group instruction with preschoolers who are deaf or hard of hearing: An exploratory study. Deafness & Education International, 16, 22. https://doi.org/10.1179/1557069X13Y.0000000028	2. Outcome

	6. Publication Date
Romer, Lyle T, White, Jennifer & Haring, Norris G. (1996). The effect of peer mediated social competency training on the type and frequency of social contacts with students with deaf-blindness. Education & Training in Mental Retardation & Developmental Disabilities, 31(4), 324-338. Retrieved from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=psyc3&NEWS=N&AN=1996-07023-006	6. Publication Date
Rosen, Eric L. (1991). Structured learning social skills training with deaf adolescents: An examination of the effectiveness of using structured learning technique with profoundly and severely deaf students enrolled at a residential school for the deaf. Dissertation Abstracts International Section A: Humanities and Social Sciences, 52(3-A), 855. Retrieved from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=psyc3&NEWS=N&AN=1992-72936-001.	6. Publication Date
Turnbow, Karen. (1984). The effects of assertiveness training on deaf children's development of social competency. Dissertation Abstracts International, 44(9-B), 2910. Retrieved from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=psyc2&NEWS=N&AN=1984-54247-001.	6. Publication Date
Vega-Lahr, Nitza Beatriz. (1996). Promoting social interaction between young children with and without hearing impairments: Effects of group-oriented contingencies and task interdependence. Dissertation Abstracts International Section A: Humanities and Social Sciences, 56(9-A), 3516. Retrieved from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=psyc3&NEWS=N&AN=1996-95006-037.	6. Publication Date

Appendix 3

An example Coding Protocol for Weight of Evidence A: <u>Studies with a Control group</u>

<u>Taken from:</u> Gersten, R., Fuchs, L. S., Compton, D., Coyne, M., Greenwood, C., & Innocenti, M. S. (2005). Quality indicators for group experimental and quasiexperimental research in special education. Exceptional children, 71(2), 149-164.

Study: <u>Adibsereshki, Vernosfaderani & Movalli (2015)</u>

Essential Quality Indicators

<u>Quality Indicators for Describing Participants</u>

1. Was sufficient information provided to determine/confirm whether the participants demonstrated the disability(ies) or difficulties presented?

☒Yes ☐No ☐N/A ☐Unknown/Unable to Code

Rationale: HI described at mild to moderate. Use of hearing aids described. IQ all described at in normal range. Ability to understand lip reading described.

2. Were appropriate procedures used to increase the probability that teachers or interventions were comparable across conditions?

☒Yes ☐No ☐N/A ☐Unknown/Unable to Code

Rationale: Random assignment of HI participants to each condition

3. Was sufficient information given characterising the interventions or teachers provided? Did it indicate whether they were comparable across conditions?

☐Yes ☒No ☐N/A ☐Unknown/Unable to Code

Rationale: No information given about who ran the groups. No information given about what the control group condition involved.

Quality Indicators for Implementation of the Intervention and Description of Comparison Conditions

1. Was the intervention clearly described and specified?

☒Yes ☐No ☐N/A ☐Unknown/Unable to Code

Rationale: The paper outlined the types of things that would happen e.g. activities, role modelling, and lecturing. The sessions topics were included.

2. Was the fidelity of implementation described and assessed?

☐Yes ☐No ☐N/A ☒Unknown/Unable to Code

Rationale: No mention of fidelity through intervention checklists, observation of intervention or any specified intervention instructions.

3. Was the nature of services provided in comparison conditions described?

☐Yes ☒No ☐N/A ☐Unknown/Unable to Code

Rationale: No mention of what control condition involved.

<u>*Quality Indicators for Outcome Measures*</u>

1. Were multiple measures used to provide an appropriate balance between measures closely aligned with the intervention and measures of generalised performance?

☐Yes ☒No ☐N/A ☐Unknown/Unable to Code

Rationale: Only used SSRI Teacher form

2. Were outcomes for capturing the intervention's effect measured at the appropriate times?

☒Yes ☐No ☐N/A ☐Unknown/Unable to Code

Rationale: Measured pre, immediate post and 1-month post.

<u>*Quality Indicators for Data Analysis*</u>

1. Were the data analysis techniques appropriately linked to key research questions and hypotheses? Were they appropriately linked to the unit of analysis in the study?

☒Yes ☐No ☐N/A ☐Unknown/Unable to Code

Rationale: ANCOVA of impact of intervention on SSRI test scores for overall social skills, and sub domains of assertiveness, self-control and cooperation.

2. Did the research report include not only inferential statistics but also effect size calculations?

☒Yes ☐No ☐N/A ☐Unknown/Unable to Code

Rationale: Eta squared is reported.

Desirable Quality Indicators

1. Was data available on attrition rates among intervention samples? Was severe overall attrition documented? If so, is attrition comparable across samples? Is overall attrition less than 30%?

☐Yes ☐No ☐N/A ☒Unknown/Unable to Code

Rationale: No information on attrition.

2. Did the study provide not only internal consistency reliability but also test-retest reliability and interrater reliability (when appropriate) for outcome measures? Were data collectors and/or scores blind to study conditions and equally (un)familiar to examinees across study conditions?

☐Yes ☒No ☐N/A ☐Unknown/Unable to Code

Rationale: Reported test-retest reliability but no others.

3. Were outcomes for capturing the intervention's effect measured beyond an immediate post-test?

☒Yes ☐No ☐N/A ☐Unknown/Unable to Code

Rationale: One month on

4. Was evidence of the criterion-related validity and construct validity of the measures provided?

☒Yes ☐No ☐N/A ☐Unknown/Unable to Code

Rationale: States that criterion-related and construct validity of the scales has been demonstrated by significant correlations with other rating scales.

5. Did the research team assess not only surface features of fidelity implementation (e.g. number of minutes allocated to the intervention or teacher/interventionist following procedures specified), but also examine quality of implementation?

☐Yes ☐No ☐N/A ☒Unknown/Unable to Code

Rationale: No mention of treatment fidelity.

6. Was any documentation of the nature of instruction or series provided in comparison conditions?

☐Yes ☒No ☐N/A ☐Unknown/Unable to Code

7. Did the research report include actual audio or videotape excerpts that capture the nature of the intervention?

☐Yes ☒No ☐N/A ☐Unknown/Unable to Code

8. Were results presented in a clear, coherent fashion?

☒Yes ☐No ☐N/A ☐Unknown/Unable to Code

Overall Rating of Evidence:

	Total	Score
Essential Quality Indicators (out of 10)	6	0
Desirable Quality Indicators (out of 8)	3	1
Total Score: (3 = High Quality; 2 = acceptable Quality; 1/0 = Poor Quality)	1	

Appendix 4

An example Coding Protocol for Weight of Evidence A: <u>Studies without a Control</u>

<u>*group*</u>

<u>Adapted from</u>: Gersten, R., Fuchs, L. S., Compton, D., Coyne, M., Greenwood, C., &

Innocenti, M. S. (2005). Quality indicators for group experimental and

quasiexperimental research in special education. Exceptional children, 71(2), 149-

164

The following studies did not have a control group and therefore the questions

relevant to comparison groups in Gersten et al.'s coding protocol were removed. The

total score at the end was adapted to reflect the criteria removed based on Gersten

et al.'s recommendation that studies must meet all but one of the Essential Quality

Indicators.

Study: <u>Prusnek et al. (2019)</u>

Essential Quality Indicators

<u>Quality Indicators for Describing Participants</u>

1. Was sufficient information provided to determine/confirm whether the participants

demonstrated the disability(ies) or difficulties presented?

☒Yes ☐No ☐N/A ☐Unknown/Unable to Code

Rationale: HI described as bilateral hearing loss ranging from moderate to profound.

Details around hearing aids and cochlear implants was included.

~~2. Were appropriate procedures used to increase the probability that teachers or interventions were comparable across conditions?~~

~~☐Yes ☐No ☐N/A ☐Unknown/Unable to Code~~

3. Was sufficient information given characterising the interventions or teachers provided? ~~Did it indicate whether they were comparable across conditions?~~

☒Yes ☐No ☐N/A ☐Unknown/Unable to Code

Rationale: The study includes information about Occupational therapy students who acted as research students and ran this study.

Quality Indicators for Implementation of the Intervention ~~and Description of Comparison Conditions~~

1. Was the intervention clearly described and specified?

☒Yes ☐No ☐N/A ☐Unknown/Unable to Code

2. Was the fidelity of implementation described and assessed?

☒Yes ☐No ☐N/A ☐Unknown/Unable to Code

Rationale: Information about the intervention used is included. The study followed that structure and referenced the program information, materials and details.

3. Was the nature of services provided in comparison conditions described?

☐Yes ☐No ☐N/A ☐Unknown/Unable to Code

Quality Indicators for Outcome Measures

1. Were multiple measures used to provide an appropriate balance between measures closely aligned with the intervention and measures of generalised performance?

☒Yes ☐No ☐N/A ☐Unknown/Unable to Code

Rationale: The social Profile: Children's Version was used to quantitively measure pre and post. A cross-sectional survey designed by the primary investigator was also used to measure research assistants' perceptions of effectiveness.

2. Were outcomes for capturing the intervention's effect measured at the appropriate times?

☒Yes ☐No ☐N/A ☐Unknown/Unable to Code

Rationale: Pre and post

Quality Indicators for Data Analysis

1. Were the data analysis techniques appropriately linked to key research questions and hypotheses? Were they appropriately linked to the unit of analysis in the study?

☒Yes ☐No ☐N/A ☐Unknown/Unable to Code

Rationale: Means and SDs were gathered for the pre and post quantitative test. Qualitative analysis was done for the survey given to research assistants.

2. Did the research report include not only inferential statistics but also effect size calculations?

☐Yes ☒No ☐N/A ☐Unknown/Unable to Code

Desirable Quality Indicators

1. Was data available on attrition rates among intervention samples? Was severe overall attrition documented? If so, is attrition comparable across samples? Is overall attrition less than 30%?

☒Yes ☐No ☐N/A ☐Unknown/Unable to Code

Rationale: 1 participant from each condition were excluded due to attendance.

2. Did the study provide not only internal consistency reliability but also test-retest reliability and interrater reliability (when appropriate) for outcome measures? Were data collectors and/or scores blind to study conditions and equally (un)familiar to examinees across study conditions?

☐Yes ☒No ☐N/A ☐Unknown/Unable to Code

3. Were outcomes for capturing the intervention's effect measured beyond an immediate post-test?

☐Yes ☒No ☐N/A ☐Unknown/Unable to Code

4. Was evidence of the criterion-related validity and construct validity of the measures provided?

☐Yes ☒No ☐N/A ☐Unknown/Unable to Code

Rationale: Construct validity is discussed but not criterion-related.

5. Did the research team assess not only surface features of fidelity implementation (e.g. number of minutes allocated to the intervention or teacher/interventionist following procedures specified), but also examine quality of implementation?

☐Yes ☐No ☐N/A ☒Unknown/Unable to Code

~~6. Was any documentation of the nature of instruction or series provided in comparison conditions?~~

~~☐Yes ☐No ☐N/A ☐Unknown/Unable to Code~~

7. Did the research report include actual audio or videotape excerpts that capture the nature of the intervention?

☐Yes ☒No ☐N/A ☐Unknown/Unable to Code

8. Were results presented in a clear, coherent fashion?

☒Yes ☐No ☐N/A ☐Unknown/Unable to Code

Overall Rating of Evidence:

	Total	Score
Essential Quality Indicators (out of 8)	7	1
Desirable Quality Indicators (out of 7)	2	1
Total Score: (3 = High Quality; 2 = acceptable Quality; <2 = Poor Quality)		2

Appendix 5

WoE A

Table 1 shows the scoring criteria for WoE A, based on Gersten et al.'s (2005) recommendations. Table 2 shows the overall WoE coding for the six studies in this review.

Table 1

WoE A Score	Criteria
3 – High	• Study meets all but one of the Essential Quality Indicators • Study meets at least four of the Desirable Quality Indicators
2 – Acceptable	• Study meets all but one of the Essential Quality Indicators and at least one of the Desirable Quality Indicators • OR Study does not meet all but one of the Essential Quality Indicators but does meet at least four of the Desirable Quality Indicators
1 - Poor	• Study does not meet all but one of the Essential Quality Indicators • OR Study does not meet at least one of the Desirable Quality indicators

Table 2

	Study	Essential Quality Indicators	Desirable Quality Indicators	Overall WoE A
Original Protocol	Adibsereshki & Movallali (2015)	6/10	3/8	1
	Azizi et al. (2019)	7/10	1/8	1
	Naeini et al. (2013)	5/10	2/8	1
	Vernosfaderani & Movallali (2013)	6/10	1/8	1
Adapted Protocol	Prusnek et al. (2019)	7/8	2/7	2
	Suárez (2000)	6/8	1/7	1

Appendix 6

WoE B

WoE B is a review-specific judgement about the appropriateness of the study design for answering the current review question. It is therefore focused on the fitness for purpose of each study and how appropriate each study is in concluding that group social skills training is effective for improving social competence for pupils with HI. WoE B was calculated based on Petticrew and Roberts' (2003) typology of evidence for research questions of effectiveness and is shown in table 1. The rationale behind this typology is that the appropriateness of different study designs depends on the research question asked. For effectiveness questions, RCTs have a high level of experimental control and therefore are able to measure an interventions impact. Table 2 provides the scores for each study in this review for WoE B.

Table 1

	Poor – 1	Acceptable – 2	High – 3
Study design	Qualitative research Survey Case-control studies Non-experimental evaluations No control group	Quasi-experimental studies Cohort studies Control group	Experimental studies RCTs Systematic Reviews Control group

Table 2

Study	WoE B Score
Adibsereshki & Movallali (2015)	3
Azizi et al. (2019)	2
Naeini et al. (2013)	2
Vernosfaderani & Movallali (2013)	2
Prusnek et al. (2019)	1
Suárez (2000)	1

Appendix 7

WoE C

WoE C is a review-specific judgement about the relevance of the focus of the study evidence to this specific question. It looks at how relevant each study is to the current research question of the effectiveness of social skills training on the social competence of pupils with HI. The criterion is shown in table 1. Each total for each study was added up and divided by five as there are five sets of criteria. The scores for each study are for WoE C are shown in table 2.

Table 1

Criteria	WoE C Rating	Rationale
Location of study	3 – UK 2 – OECD countries 1 – Non-OECD countries	Countries more similar to the UK are more generalisable to the UK education system
Number of sessions	3 – Above 10 sessions 2 – 5-10 sessions 1 – Below 5 sessions	Interventions lasting longer than 10 sessions are likely to have a stronger or long-lasting impact.
Intervention focus	3 – The studies only focus is on social competence 2 – The study is focused on social competence and other unrelated measures 1 – Did not focus on social competence	Interventions only focusing on social competence are most relevant to this question.
Outcome measure variety	3 – Used more than one measure of social competence 2 – Used a single measure of social competence 1 – used no measure of social competence	More than one measure of social competence is likely to increase validity and reliability of the intervention.

Intervention setting	3 – based in a school 2 – based in the community/clinic or assumed other professional setting 1 – based at home	This review question is concerned with a school-based intervention.

Table 2

Study	Location	Number of sessions	Intervention focus	Outcome measure variety	Intervention setting	Overall WoE C score
Adibsereshki & Movallali (2015)	1	3	3	2	2	2.2
Azizi et al. (2019)	1	2	2	2	2	1.8
Naeini et al. (2013)	1	3	3	2	3	2.4
Vernosfaderani & Movallali (2013)	1	3	2	2	3	2.2
Prusnek et al. (2019)	2	2	2	2	3	2.2
Suárez (2000)	2	3	3	3	3	2.8