



Success of deaf adults: a 30-year scoping review

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Abstract

This scoping review examines how academic, career, and life success of deaf and hard-of-hearing (DHH) individuals has been investigated, as well as which measures have been used to assess success and its associated factors. A search of studies published in English, Spanish and Portuguese between 1992 and 2022 in nine databases was conducted, complemented by a manual search. Of the 18,716 potential records retrieved (18,655 from databases and 61 from the manual search), 67 were included in this review, encompassing a total of 1,233,472 individuals. The results showed a predominant focus on academic and career success and to a lesser extent on life success, an educational and professional gap with the hearing population, gender inequalities among DHH people, and a preference for objective measures of success. A variety of factors influence success trajectories, including social capital, family support, and educational services for academic success; level of education for career success; and positive interpersonal relationships and membership in the deaf community for life satisfaction. Limitations regarding language and quality assessment are acknowledged.

Keywords Academic success · Career success · Life success · Scoping review · Deaf · Hard-of-hearing

The discrimination and communication barriers that deaf and hard-of-hearing (DHH) people face on a daily basis are likely to impact their success in various areas of their lives. These barriers appear already in childhood in the family environment itself, as approximately 96% of DHH individuals are born into families in which their parents are hearing (Mitchell & Karchmer, 2004; White, 2018). The lack of natural communication in the family between the deaf child and his or her parents, often with the rejection of sign language and their subsequent inclusion in exclusively oral educational programs (Hall et al., 2019), leads to higher rates of language deprivation, with permanent negative consequences on their cognitive development and psychosocial health (for a review, Hall, 2017; Humphries et al., 2019). Even very mild deafness of 16 to 26 dB is enough to negatively impact their school learning and language development because of inadequate attention from the school that

fail to recognize such potential impact (Goldberg & Richburg, 2004). This situation may be analogous to the use of hearing aids such as cochlear implantation in recent decades, as so far cochlear implants do not elicit natural hearing and the causes of the notable individual differences and variability in their outcomes remain unknown (Humphries et al., 2016; Pisoni et al., 2017). When early intervention in the deaf child is based solely on oral intervention through cochlear implantation and sign language is denied, the risk of language deprivation is greater (Hall, 2017). It is estimated that 80–85% of deaf children are at risk for language deprivation (Humphries et al., 2012; Odenthal, 2023).

After compulsory education, DHH individuals' complete university studies at lower rates than the general hearing population. In addition, DHH people have higher levels of unemployment or underemployment compared to the general hearing population (Dammeyer & Marschark, 2016, in Denmark; Garberoglio et al., 2019, in the United States; Rydberg et al., 2009, in Sweden; Winn, 2007, in Australia; Woodcock & Pole 2008, in Canada).

In adulthood, negative consequences for mental and physical health have been identified (see e.g. Fellingner et al., 2008; Fellingner et al., 2012; Mousley & Chaudoir, 2018; Shields et al., 2016; Tsimpida et al., 2018). Rogers et al. (2024) showed that the physical and mental health outcomes

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of deaf adults who use sign language are generally poorer than those of the general hearing population. For example, late diagnosis of cancer, higher rates of overweight or obesity, lack of diabetes control, lower levels of psychological well-being, higher rates of depression and anxiety, and higher rates of suicide attempts. One of the main reasons for their poorer health status is the presence of communication barriers that limit access to health services (Rogers et al., 2024).

These challenges, which include inequities in education and employment, restricted access to health services, and health issues, can limit the opportunities available to DHH individuals to achieve their potential success in various spheres of life. Success is a subjective and multidimensional construct, generally understood as the achievement of goals and objectives to a satisfactory or desired level. The success of DHH people may be shaped by distinct and unique experiences compared to the general hearing population, given the multiple communication barriers in society that hinder equal opportunities in their lives. It may be helpful to explore how success has been approached and studied specifically in the DHH population, focusing on both the diversity of experiences and the factors that contribute to positive outcomes, to provide clarity and structure to this complex topic. However, no systematic review has yet been published providing an overview of the success of DHH individuals and the factors that contribute to it. This scoping review aims to address this gap by answering the following questions: 1. What dependent variables have been used to measure successful deaf adults in each area? 2. How has academic, career, and life success of deaf people been investigated in the literature? 3. What factors have been related to the success of deaf adults in each area?

Methods

This scoping review follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) extension for scoping reviews (Tricco et al., 2018). A protocol was registered with the Open Science Framework on 9 February 2023 (link in the data availability section).

Inclusion criteria were full-text articles published in peer-reviewed journals, full-text conference proceedings, and doctoral theses, and the exclusion criteria were texts on extremely specific topics or skills (i.e., mathematical achievement, lip-reading accuracy, or success of cochlear implant surgery) not related to a general conceptualization of success (academic, career or life), non-peer-reviewed studies, book chapters, conference abstracts, editorial pieces,

theoretical papers, unpublished theses, book reviews, and full-text not available in English, Spanish, or Portuguese. The target population was DHH from all countries and socio-demographic conditions, with the exception of those who were deafblind or had additional disabilities and research participants under the age of 18. The languages of the search were limited to English, Spanish and Portuguese, the main languages in which the researchers were proficient, and the years considered were from 1992 to 2022, in the hope of covering a wider range of literature.

Dialnet, Eric EBSCO, JSTOR, LILACS, Psycodoc, PubMed, PubPsych, PsychINFO, and Web of Science were searched. To ensure saturation of the literature, the bibliographic references of the included studies were also examined to find articles that would not have been detected in the databases and extensive searches were conducted on Google, Google Scholar and Elicit. Searches were conducted by title and abstract where the bibliographic database allowed. To ensure a broad search, the keywords ‘deaf’, ‘success’, and a number of synonyms for each were used, despite the risk of having many results that were unrelated to the research questions. The search terms for each database were reviewed by a librarian from the University of Castilla-La Mancha. The search expressions (adapted to the rules of each database) were as follows:

(deaf* OR "hard of hearing" OR "hearing disab*" OR "hearing handicap*" OR "hearing impair*" OR "hearing loss") AND (success* OR accomplishment OR achiev* OR breakthrough OR talent*)

Literature search results were exported and uploaded to the online tool Rayyan (Ouzzani et al., 2016), where the selection process follow these steps: First, duplicates were detected with Rayyan and removed where appropriate. Then, two researchers made an initial selection of studies by blindly screening the titles and abstracts against the inclusion and exclusion criteria. For all titles/abstracts that met the inclusion criteria and for those that were uncertain, the researchers examined the full texts before the final decision. Discrepancies in any of the screening phases would involve a third researcher to reach a consensus.

The main researcher extracted the following data from the selected studies into an Excel spreadsheet: author, year, country of study, main aims, area of success identified, type of study, methods, sample size, sample characteristics (if applicable), dependent variables used to measure success (only from quantitative studies that explicitly reported them to minimize the risk of interpretation and bias), key findings, and summary of conclusions. The extracted data were

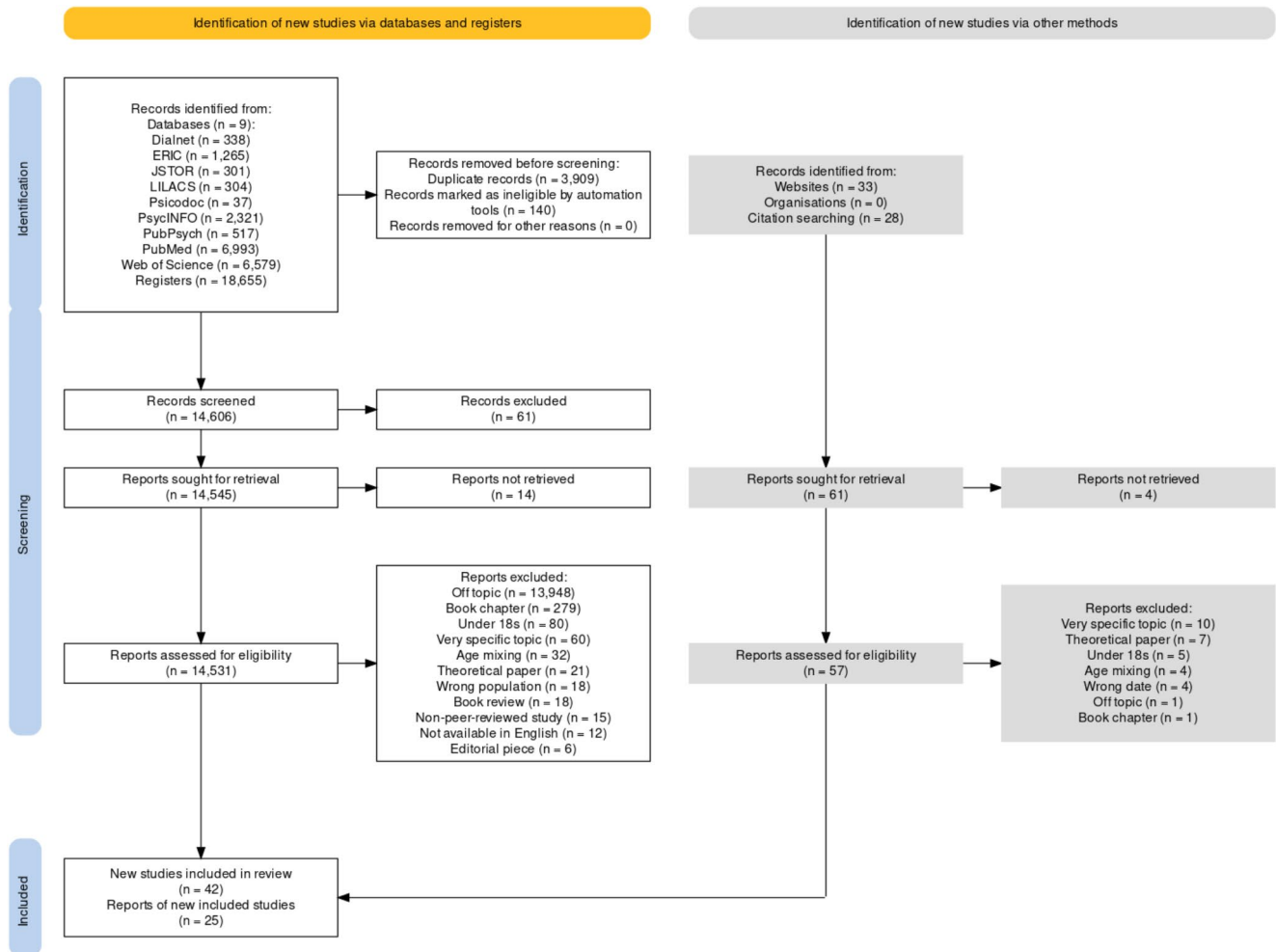


Fig. 1 PRISMA flow diagram for the scoping review of the success of deaf adults. Done with the PRISMA Flow Diagram tool (Haddaway et al., 2022)

reviewed by the three researchers and refined where necessary. Finally, a thematic analysis of the datasets included in the review was conducted using QDA Miner Lite 3.0 (Provalis Research, 2004). Open coding was applied to the key findings and conclusions, identifying and assigning subcodes to the data fragments that were relevant to our research questions in order to facilitate further analysis and discussion of the following results.

Results

Overview

A total of 18,716 potential records were identified, including 18,655 from database searches and 61 through manual searching (see PRISMA flowchart in Fig. 1). 3,909 were duplicates, 13,948 were excluded for various reasons,

and 67 are part of this scoping review.¹ Of these, 42 were retrieved from the database search and 25 from the manual search (see summary in Online Resource 1). The 67 studies were published in English and came from 17 different countries. Most studies were from the United States of America ($N=37$; 55.2% of the total number of studies selected), followed by Sweden ($N=5$), Australia ($N=4$), and studies conducted in two or more countries ($N=3$). Denmark, the United Kingdom, and "Not applicable" each accounted for 2 studies. The remaining countries contributed one study each: Canada, Ethiopia, Germany, Greece, Norway, the

¹ Note that as per one reviewer's suggestion, we conducted an additional analysis restricting the scope of the review to studies published between 2000 and 2022 to account for recent technological and political changes. This adjustment excluded eight studies published prior to 2000 and there were no changes in the results. We include those studies as they offer valuable insights into historical trends and provide a broader contextual perspective.

Table 1 Summary of studies in which the race/ethnic group of the sample is reported

Ethnicity/Race	Author(s)	Count
Caucasian/White	Albertini et al., 2012; Braswell-Burris, 2010; Cawthon et al., 2015; Crowe, 2019; Garberoglio et al., 2014; Greene-Woods et al., 2020; Hefferly, 2009; Jung & Bhattacharyya, 2012; Kim et al., 2018; Langston, 2012; Liversidge, 2003; Mousley & Chaudoir, 2018; Rogers et al., 2003; Schroedel & Geyer, 2000; Schroedel et al., 1996; Schroedel & Geyer, 2001; Scruggs, 2017; Tanner, 2018	18
Hispanic/Latino	Albertini et al., 2012; Braswell-Burris, 2010; Crowe, 2019; Greene-Woods et al., 2020; Hefferly, 2009; Jung & Bhattacharyya, 2012; Johnson, 2014; Kurz et al., 2016; Mousley & Chaudoir, 2018; Torres, 2019	10
African American/Black	Albertini et al., 2012; Braswell-Burris, 2010; Greene-Woods et al., 2020; Hefferly, 2009; Jung & Bhattacharyya, 2012; Johnson, 2014; Kurz et al., 2016; Mousley & Chaudoir, 2018; Scruggs, 2017	9
Asian/Pacific	Albertini et al., 2012; Greene-Woods et al., 2020; Liversidge, 2003; Johnson, 2014; Mousley & Chaudoir, 2018	5
Native American	Albertini et al., 2012; Mousley & Chaudoir, 2018	2
Multiracial	Johnson, 2014; Mousley & Chaudoir, 2018	2
Arabic/Middle East	Greene-Woods et al., 2020; Mousley & Chaudoir, 2018	2
Other/Unknown	Albertini et al., 2012; Hefferly, 2009; Jung & Bhattacharyya, 2012; Geyer & Schroedel, 1998; Schroedel & Geyer, 2001; Scruggs, 2017	6

Philippines, Saudi Arabia, South Africa, Spain, Switzerland, Taiwan, and Zambia.

The 67 selected studies included a total of 1,233,472 DHH people (range 3–933,921). In 17 studies, the sex/gender of the samples was not reported, and four of these presented only aggregated data or had unclear data. Among the studies that reported sex/gender data, most of them reported nearly equal distributions, though some demonstrated significant imbalances, with notably higher proportions of female participants (e.g., Crowe, 2019; Jacobs et al., 2012; Richardson & Woodley, 2001; Scruggs, 2017), predominantly or exclusively male samples (e.g., Butler, 2012; Danermark et al., 2001; Langston, 2012). Only 29.8% ($N=20$) of the studies had diverse samples, including individuals from ethnic or racial groups other than Caucasian/White (see Table 1). Table 2 summarizes the studies by the mean age of their samples. Most of the studies report the age of their samples,

Table 2 Summary of studies by mean age of the sample

Age Range	Author(s)	Count
20–29.9	Danermark et al., 1996; Danermark et al., 2001; Foster et al., 1999; Geyer & Schroedel, 1998; Perkins-Dock et al., 2015; Punch & Duncan, 2022	6
30–39.9	Backenroth-Ohsako et al., 2003; Braswell-Burris, 2010; Mousley & Chaudoir, 2018; Greene-Woods et al., 2020; Tanner, 2018; Macleod-Gallinger, 1992, 2019; Parving & Christensen, 1993; Rosengreen & Saladin, 2010; Thompson & Easterbrooks, 2019; Schroedel & Geyer, 2001	10
40–49.9	Cruz & Calimpusan, 2018; Doolabh & Khan, 2020; Jung & Bhattacharyya, 2012; Kim et al., 2018; Liu, 2013; Liversidge, 2003; Luckner & Stewart, 2003; Omar, 2014; Torres, 2019	9
50+	Crowe, 2019; Dammeyer et al., 2019; Hefferly, 2009; Hintermair et al., 2018; Hogan et al., 2009; Jacobs et al., 2012; Kos et al., 2007; Kurz et al., 2016; Richardson & Woodley, 2001; Schroedel & Geyer, 2000; Tsimpida et al., 2018	12
Data not available, unclear or aggregated data only	Bell & Foiret, 2020; Brooks, 2011; Bryan, 2018; Buckley 2019; Butler, 2012; Convertino et al., 2009; Foster & MacLeod, 2004; Garberoglio et al., 2014; Johnson, 2014; Kumatongo & Muzata, 2021; Palmer et al., 2020; Punch, 2016; Punch et al., 2007; Rogers et al., 2003; Rydberg et al., 2009; Schley et al., 2011; Walter et al., 2002	17

Note. The arithmetic mean between the lower and upper limit was calculated for studies reporting age ranges. When multiple age ranges were provided within a single study, a weighted mean was calculated based on the number of participants in each range

and for those that do not, it can be inferred that the participants are adults, such as samples composed of individuals of working age or participants selected after graduating from university. Regarding characteristics related to deafness, 41.7% ($N=28$) of the studies provide no information. Among those that do, the most frequently reported characteristics are the degree of hearing loss and the preferred language of communication (see Table 3).

Of the 67 studies included in this scoping review, only 19 explicitly provided operational definitions for the terms deaf and/or hard-of-hearing. Some studies employed audiological thresholds to define participants, such as “hearing loss greater than 70 dB” (Liversidge, 2003), while others incorporated sociocultural dimensions. For instance, the term capitalized Deaf was defined by several studies as a marker of cultural identity, emphasizing shared language and values, whereas lowercase deaf was frequently used to denote the audiological condition of hearing loss (e.g., Bryan, 2018; Johnson, 2014; Scruggs, 2017; Tanner, 2018). To accommodate diverse contexts, some studies adopted broad or flexible definitions, such as self-identification or

Table 3 Summary of studies by deafness characteristic reported in the sample

Characteristic	Author(s)	Count
Degree of hearing loss	Alkharji & Cheong (2022); Basha et al. (2020); Braswell-Burris (2010); Dammeyer & Marschark (2016); Dammeyer et al. (2019); Geyer & Schroedel (1998); Greene-Woods et al. (2020); Hintermair et al. (2018); Liu (2013); Liversidge (2003); Punch & Duncan (2022); Punch et al. (2007); Rogers et al. (2003); Rosengreen & Saladin (2010); Tanner (2018)	16
Preferred language of communication	Alkharji & Cheong (2022); Braswell-Burris (2010); Brooks (2011); Bryan (2018); Butler (2012); Crowe (2019); Hintermair et al. (2018); Kurz et al. (2016); Liu (2013); Punch & Duncan (2022); Punch et al. (2007); Rogers et al. (2003); Rosengreen & Saladin (2010); Scruggs (2017); Torres (2019); Tsimpida et al. (2018)	16
Identity or cultural affiliation	Bryan (2018); Butler (2012); Mousley & Chaudoir (2018); Omar (2014); Perkins-Dock et al. (2015); Punch et al. (2007); Schroedel & Geyer (2000); Schroedel & Geyer (2001); Schroedel et al. (1996); Tsimpida et al. (2018)	10
Hearing aids use	Backenroth-Ohsako et al. (2003); Dammeyer et al. (2019); Hefferly (2009); Hintermair et al. (2018); Kos et al. (2007); Kurz et al. (2016); Liu (2013); Punch & Duncan (2022); Punch et al. (2007); Rydberg et al. (2009); Rydberg et al. (2011)	12
Age of onset of deafness	Backenroth-Ohsako et al. (2003); Basha et al. (2020); Dammeyer & Marschark (2016); Liu (2013); Liversidge (2003); Parving & Christensen (1993)	6
Parental Hearing Status	Kurz et al. (2016); Liu (2013); Luckner & Stewart (2003); Scruggs (2017); Tanner (2018)	5
None or aggregated data only	Albertini et al. (2012); Buckley (2019); Cawthon et al. (2015); Convertino et al. (2009); Cruz & Calimpuan (2018); Danermark et al. (2001); Danermark et al. (1996); Doolabh & Khan (2020); Foster & MacLeod (2004); Foster et al. (1999); Garberoglio et al. (2014); Garberoglio et al. (2021); Garramiola-Bilbao & Rodriguez-Alvarez (2016); Hogan et al. (2009); Istad & Engdahl (2019); Jacobs et al. (2012); Johnson (2014); Jung & Bhattacharyya (2012); Kim et al. (2018); Kumatongo & Muzata (2021); Langston (2012); MacLeod-Gallinger (1992, 2019); Palmer et al. (2020); Richardson & Woodley (2001); Schley et al. (2011); Thompson & Easterbrooks (2019); Walter et al. (2002)	28
Not applicable	Bell & Foiret (2020); Punch (2016)	2

Note. A study may have reported more than one characteristic

attendance at schools for the deaf (e.g., Perkins-Dock et al., 2015; Rydberg et al., 2011). This variability reflects differences in the aims of each study and the broad scope of this review, which sought to explore the success among DHH individuals, allowing for diverse and occasionally inconsistent definitions to emerge.

In terms of methods used, 55.2% were quantitative ($N=37$), 35.8% were qualitative ($N=24$) and the remaining 9% used mixed methods ($N=6$). A clear preference for quantitative methods was found in the three areas of success, as they represent 48.3% of the studies on academic success, 57.9% of the studies on career success and 63.6% of the studies on life success.

Only quantitative studies that explicitly reported their dependent variables were considered in the review of the variables. A total of 18 quantitative studies reported dependent variables, with 11 addressing academic success, 7 addressing career success, and 4 addressing life success (some studies addressed more than one type of success). Objective measures were employed in 66.7% of the studies ($N=12$), 11.1% opted for subjective measures ($N=2$), and both types of measures were used in the remaining 22.2% ($N=4$).

Finally, the number of published studies on success of deaf people increased progressively within the review period (Fig. 2). By areas of success (Fig. 3), the most studied was career success ($N=38$), followed by academic success ($N=29$) and then life success ($N=10$).

The thematic analysis generated six categories in the findings reported for academic and career success (choices, comparison, description, hearing perspectives, factors, and strategies), and three categories for life success (comparison, description, and factors). These categories and their corresponding segment counts are summarized as follows:

Academic success:

- Choices: Factors or variables that explain the choice of studies ($N=2$).
- Comparison: Comparison of academic outcomes with hearing students ($N=15$).
- Description: Description of educational outcomes or situations without correlations or comparison with other situations outside the target group ($N=10$).
- Hearing Perspectives: Views and opinions of hearing individuals regarding the academic performance of DHH students ($N=3$).
- Factors: Factors or variables related to academic success or academic performance, including those that serve as predictors and negative relations ($N=62$).
- Strategies: Strategies adopted to succeed educationally or to navigate successfully in a hearing educational environment ($N=2$).

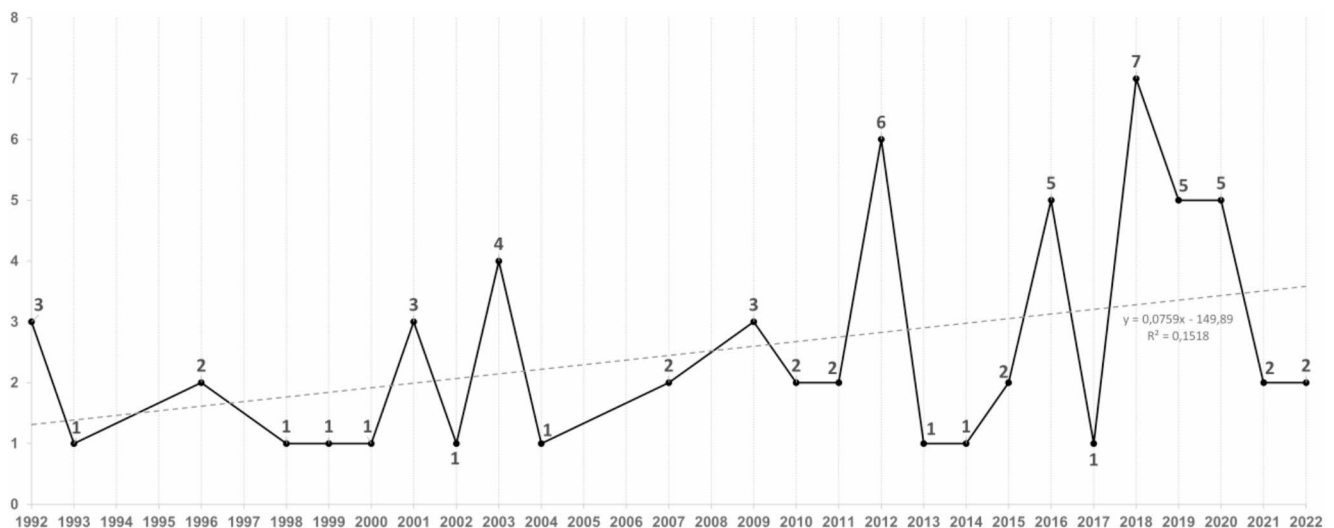


Fig. 2 Studies included in the review by year of publication with linear trend line

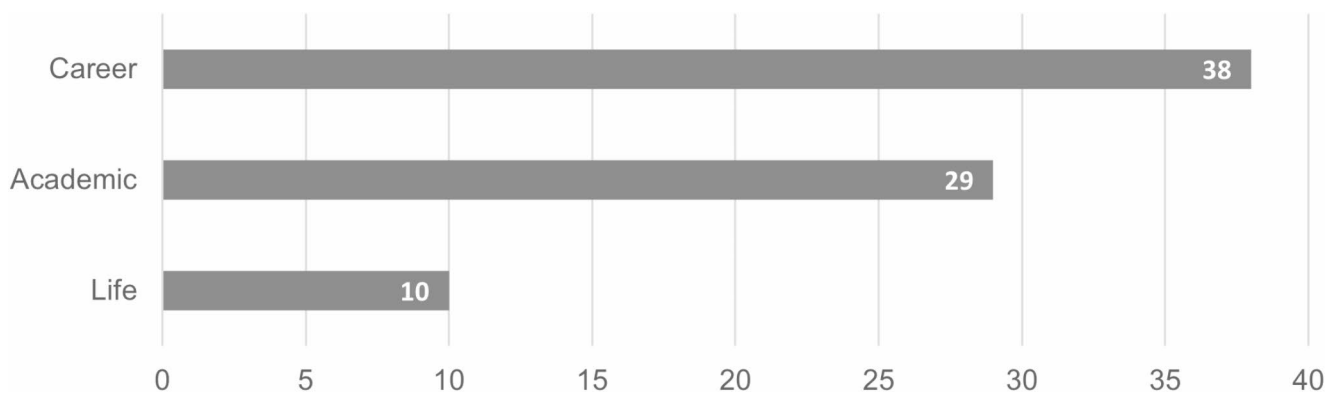


Fig. 3 Studies included in the review by type of success addressed. Note. A study can address more than one area of success

Career success:

- Choices: Factors or variables explaining career choice ($N=5$).
- Comparison: Comparison of employment outcomes with hearing persons ($N=23$).
- Description: Description of professional outcomes or work situations without correlations or comparisons with other situations outside the target group ($N=21$).
- Hearing Perspectives: Views and opinions of hearing individuals regarding the professional performance of DHH workers ($N=3$).
- Factors: Factors or variables associated with career success or career performance, including those that function as predictors and negative relations ($N=75$).
- Strategies: Strategies adopted for professional success or for successfully navigating a hearing work environment ($N=13$).

Life success:

- Comparison: Comparison of vital aspects with hearing people ($N=2$).
- Description: Description of life situations without correlations or comparisons with other situations ($N=5$).
- Factors: Factors or variables associated with life success or life well-being, including those that function as predictors and negative relations ($N=37$).

Academic success

Dependent variables

All studies with dependent variables on academic success used two main categories of measures: the scores achieved in assessments or exams (Albertini et al., 2012; Alkharji & Cheong, 2022; Basha et al., 2020; Convertino et al., 2009; Liu, 2013), and the highest level of education attained

(Cawthon et al., 2015; Dammeyer & Marschark, 2016; Garberoglio et al., 2014; Garberoglio et al., 2021; Garramiola-Bilbao & Rodríguez-Alvarez, 2016; Idstad & Engdahl, 2019).

Academic success in the literature

In general, the six studies that analyzed the level of education attained by DHH people indicated a gap between their educational achievement and that of the general hearing population in Ethiopia (Basha et al., 2020), Denmark (Dammeyer & Marschark, 2016), United States (Garberoglio et al., 2021), Spain (Garramiola-Bilbao & Rodríguez-Alvarez, 2016), Norway (Idstad & Engdahl, 2019), and Sweden (Rydberg et al., 2009).

This gap is generally characterized by lower access to and completion of higher education among DHH individuals. This pattern is found even among those with mild hearing loss (Idstad & Engdahl, 2019) and is further exacerbated among Black and Latino DHH individuals in the United States compared to their Asian Americans and White counterparts (Garberoglio et al., 2021). While Rydberg et al. (2009) observed a narrowing of the higher education gap in Sweden between 1941 and 1980, more recent research indicates that DHH individuals continue to be significantly less likely to attain higher education degrees (Garberoglio et al., 2021, in United States; Idstad & Engdahl, 2019, in Norway).

Regarding gender differences, some studies showed higher educational level for DHH females than males, with a higher probability of completing university studies (Dammeyer & Marschark, 2016, in Denmark; Garramiola-Bilbao & Rodríguez-Alvarez, 2016, in Spain; Idstad & Engdahl, 2019, in Norway; Rydberg et al., 2009, in Sweden).

Beyond educational attainment, research has also explored mental health among DHH students. Danermark et al. (1996) identified mental health issues among DHH students in Sweden, including anxiety. Sixteen years later, Albertini et al. (2012) were still finding the condition of anxiety in American deaf students as well.

Factors related

Factors related to academic success could be categorized into personal factors, and environmental factors. Environmental factors refer to both the lack or absence of such elements and therefore act as barriers to their academic development, as well as supports, accommodations, or services received by deaf people that have a potential positive or negative impact.

Personal factors were very diversified, including social skills in Cawthon et al. (2015), study skills in Liversidge

(2003), receptive skills in Convertino et al. (2009), motivation in Brooks (2011), self-beliefs in Garberoglio et al. (2014), health in Garramiola-Bilbao & Rodríguez-Alvarez (2016), self-efficacy in Johnson (2014), self-confidence in Tanner (2018), assertiveness and independence in Torres (2019), and acculturation and associated stress in Torres (2019). Several studies point to the importance of three: social capital (i.e., networks of relationships) (Braswell-Burris, 2010; Greene-Woods et al., 2020; Punch & Duncan, 2022), self-advocacy skills (Brooks, 2011; Liversidge, 2003), and academic preparation (Liversidge, 2003; Convertino et al., 2009).

Communication, academic and social barriers emerged as the most significant environmental factors that negatively impact academic performance and school retention, leading to social isolation (Basha et al., 2020; Brooks, 2011; Bryan, 2018; Danermark et al., 2001; Kumatongo & Muzata, 2021; Richardson & Woodley, 2001). In some cases, these barriers stem from an inaccessible sign language environment (Basha et al., 2020; Bryan, 2018; Johnson, 2014).

The external support received by DHH people was crucial for their motivation to pursue studies and their academic success. Support from family (Braswell-Burris, 2010; Cawthon et al., 2015; Convertino et al., 2009; Johnson, 2014; Liu, 2013; Tanner, 2018), education services (Alkharji & Cheong, 2022; Braswell-Burris, 2010; Brooks, 2011; Bryan, 2018; Convertino et al., 2009; Liversidge, 2003; Punch & Duncan, 2022), social networks (Punch & Duncan, 2022; Tanner, 2018), and deaf role models (Braswell-Burris, 2010; Bryan, 2018) contributed in different ways to academic success. The educational services included sign language interpreting, real-time captioning in classrooms, classroom adaptations, notetaking services, and counselling tailored to the specific needs of DHH students. There were a small number of studies, also with a very reduced number of participants, addressing the use of assistive technology such as hearing aids, cochlear implants, induction loop systems, etc. Based on the findings of Bell and Foiret (2020), accommodations (including the provision of assistive technology) appear to have a positive, but not significant effect on course completion (Moisey, 2004, as cited in Bell & Foiret, 2020), there is a gap in the literature concerning the effectiveness of support services, especially regarding their impact on academic achievement (Lang, 2002, as cited in Bell & Foiret, 2020), and that the locus of the consistent negative relation between hearing aid use and academic success remains inconclusive (Convertino et al., 2009). The authors conclude that “more concrete research on the effectiveness of assistive technologies for hearing needs to be conducted” and that because of the limited research available, this was not possible in their research (Bell & Foiret, 2020).

Career success

Dependent variables

The majority of studies on career success with dependent variables used employment status (having or not having a job) as the main variable (Cawthon et al., 2015; Dammeyer et al., 2019; Garberoglio et al., 2014; Garramiola-Bilbao & Rodríguez-Álvarez, 2016; Kim et al., 2018; Palmer et al., 2020), and wage or other economic indicators linked to employment (Cawthon et al., 2015; Garberoglio et al., 2014; Kim et al., 2018; Palmer et al., 2020). Despite the prevalence of the use of these objective measures, some studies also used subjective sources of information, such as deaf worker job satisfaction (Cawthon et al., 2015; Garberoglio et al., 2014; Geyer & Schroedel, 1998).

Career success in the literature

The studies consistently report that DHH people experience significantly higher unemployment rates compared to hearing people across various countries, including the United States (Jung & Bhattacharyya, 2012; MacLeod-Gallinger, 1992, 2019), the United Kingdom (Kim et al., 2018), Denmark (Parving & Christensen, 1993), and Sweden (Rydberg et al., 2011). According to Jung and Bhattacharyya (2012), the unemployment rate of DHH individuals in the United States can be as high as 2.2 times that of the hearing population.

When employed, DHH individuals had significantly lower wages than the general hearing population in the United States (Jung & Bhattacharyya, 2012; MacLeod-Gallinger, 1992, 2019; Schley et al., 2011), up to 25% lower (Jung & Bhattacharyya, 2012). Additionally, in both the United States (MacLeod-Gallinger, 1992, 2019) and Sweden (Rydberg et al., 2011), deaf people were frequently employed in manual or industrial jobs.

Regarding the gender gap, with the exception of Perkins-Dock et al. (2015), all studies addressing this issue reflected that DHH women were less likely than men to be in the labor force in the United States (Dammeyer et al., 2019; MacLeod-Gallinger, 1992; Walter et al., 2002) and Australia (Hogan et al. 2009), had higher unemployment rates in the United States (MacLeod-Gallinger, 1992) and Sweden (Rydberg et al., 2011), lower wages, and less access to job promotions in the United States (Schroedel et al., 1996; Schroedel & Geyer, 2000) compared to their male counterparts.

Some of the studies explored the adaptive strategies adopted by DHH individuals to achieve professional success or to cope successfully in a predominantly hearing work environment. For example, DHH people's understanding of

hearing culture and their prior preparation for interacting with hearing people was crucial to successfully navigating the professional world and to reduce the risk of isolation, as found in studies conducted in South Africa (Doolabh & Khan, 2020) and the United States (Greene-Woods et al., 2020; Kurz et al., 2016). In Sweden, Backenroth-Ohsako et al. (2003) observed that DHH individuals adopted coping strategies in their interactions, characterized by controlling or avoiding social situations. Additionally, Rosengreen and Saladin (2010) found that Australian deaf workers employed a variety of communication strategies, including writing notes, using signs, gestures, and lip reading, as well as relying on sign language interpreters.

Factors related

Many factors impact career success in different ways, with the most important being the level of education attained. A higher level of education, especially university education, was related to a higher probability of being employed (Dammeyer et al., 2019, in Denmark and the United States; Doolabh & Khan, 2020, in South Africa; Garramiola-Bilbao & Rodríguez-Álvarez, 2016, in Spain; Hogan et al., 2009, in Austria; MacLeod-Gallinger, 1992, 2019, in the United States; Rydberg et al., 2011, in Sweden; Palmer et al., 2020; Perkins-Dock et al., 2015; Schley et al., 2011; Thompson & Easterbrooks, 2019; Walter et al., 2002, in the United States), and higher pay (MacLeod-Gallinger, 1992, 2019; Palmer et al., 2020; Schroedel et al., 1996; Schley et al., 2011; Schroedel & Geyer, 2001; Walter et al., 2002).

In a predominantly hearing work environment, navigating among hearing colleagues was critical to career success. One of the main barriers was the social isolation experienced by deaf people (Butler, 2012; Doolabh & Khan, 2020; Kurz et al., 2016) even if sign language interpreters were available as there could be issues related to quality, policy, and availability of interpreters (Greene-Woods et al., 2020; Kurz et al., 2016; Rosengreen & Saladin, 2010). In all studies communication barriers were identified as the main barrier to employment (Doolabh & Khan, 2020; Greene-Woods et al., 2020; Perkins-Dock et al., 2015; Punch, 2016; Rosengreen & Saladin, 2010). Role models and social support from the Deaf community, particularly for receiving emotional support, were also positively associated with achievement and career development (Foster & MacLeod, 2004; Kurz et al., 2016).

Life success

Dependent variables

Only a small number of studies on life success included dependent variables related to life success, and these measures were characterized by their diversity. Two of the studies utilize health measures, such as quality of life (Mousley & Chaudoir, 2018; Tsimpida et al., 2018) or depressive symptoms, anxiety, alcohol consumption, and various forms of stigma (Tsimpida et al., 2018). Hefferly (2009) assesses life satisfaction, as well as activity limitations, participation restrictions, and self-efficacy. Garberoglio et al. (2014) utilize measures of independent living and self-confidence as dependent variables.

Life success in the literature

In relation to life success, most studies focused on the factors related to the achievement of this area of success (in the following section), while fewer studies offered a descriptive account of the life circumstances of DHH individuals. There is a greater interest in aspects related to quality of life and health, with mixed results due to the limited number of studies retrieved in this review and the heterogeneity of approaches and objectives addressed. Overall, although deaf individuals may experience moderate levels of satisfaction with their lives (Crowe, 2019), the main source of dissatisfaction was identified as stemming from isolation, deprivation of rights and communication barriers, even within their own hearing families (Crowe, 2019; Scruggs, 2017; Thompson & Easterbrooks, 2019).

Factors related

The factor that most consistently contributed to DHH individuals' well-being, life satisfaction and overall happiness was positive relationships with others (Crowe, 2019; Hefferly, 2009; Rogers et al., 2003; Tanner, 2018). Deaf community involvement and sign language communication, including role models (Tanner, 2018), were associated with greater perceived well-being (Crowe, 2019; Tanner, 2018). Moreover, educational attainment was associated with both a greater sense of happiness (Crowe, 2019) and a better quality of life (Thompson & Easterbrooks, 2019).

Discussion

What dependent variables have been used to measure successful deaf adults in each area?

Most studies on academic and career success used objective measures as indicators of success. The independent variables used were mainly educational attainment, as a measure of academic achievement, and employment status (having a job or not) as a measure of career achievement.

Given the historical challenges faced by deaf people in obtaining a university degree or in accessing the labor market, it is reasonable that these are the main objective measures of success. However, it is important to recognize that academic or vocational outcomes from these research perspectives may not match the perceptions and expectations of deaf people themselves. For example, a deaf person may have achieved a university degree, an objective indicator of success used in the research included in this review, but feels dissatisfied with that achievement for subjective reasons, such as dissatisfaction with the quality of the education received. Not surprisingly, several studies identified environmental barriers that negatively affect academic performance and even the mental health of deaf students. Other studies identified the isolation experienced by deaf people in predominantly hearing work environments, as well as additional difficulties to succeed professionally. Therefore, more research is needed with subjective measures to assess academic and career success. Such subjective measures are essential to capture the individual perspectives of deaf people themselves, which will contribute to a more complete and accurate understanding of their experiences and challenges in academic and employment settings. This is particularly relevant for measures of academic success: although some studies have employed subjective indicators in the career domain (e.g. Geyer & Schroedel, 1998, on job satisfaction) and the life domain (e.g., Tsimpida et al., 2018, on self-perceived quality of life), to date no studies have assessed DHH individuals' own perceptions of their academic achievements, including satisfaction with the education received.

How has academic, career and life success of deaf people been investigated in the literature?

For this systematic scoping review, studies on success of DHH people were explored during a 30-year period from 1992 to 2022. The analysis of 67 studies that met the inclusion criteria revealed that research focused predominantly on academic and career success, and to a lesser extent in life success. This pattern is consistent with the history and evolution of the study of deaf people, as deaf education has

historically been one of the first issues to be studied since the sixteenth century (Plann, 1997). The professional development of deaf people has then been a logical focus of attention in research derived from education.

Although this scoping review included studies from 17 countries, the larger number of studies conducted in the United States located in this review (55.2% of the total) could be explained by the long-established academic tradition in the United States. For example, Gallaudet University in Washington (USA), initially founded as a school for deaf and blind children in 1864, became a university in 1986 and remains today the only institution of higher education in the world specifically designed to accommodate deaf students. The university has published the *American Annals of the Deaf* since 1947, the world's first academic journal on deafness.

Regarding the characteristics of the populations studied, while some studies have focused on specific DHH populations (e.g. age range or sex/gender), the lack of reporting on race/ethnicity and deafness-related characteristics is particularly notable. This may make it difficult to compare results across studies and may also limit a comprehensive understanding of how these populations achieve success.

Most of the studies included in this review aimed to identify the factors associated with success in each area (academic, career, and life). A smaller number of studies aimed to compare the outcomes of deaf people with those of hearing people, to understand the perceptions of others in relation to the performance of deaf people, or to analyze the strategies adopted for successful navigation in a hearing environment.

Findings show a clear disparity in the level of education of DHH people compared to the hearing population, and this disparity has persisted over time despite advances in the educational levels achieved by this group, especially regarding the attainment of higher education qualifications. A lower probability of obtaining a university degree was found for deaf males, but this alone does not explain the education gap affecting the deaf population as a whole. Therefore, there is a need to uncover and address the underlying causes of these differences with the general hearing population and to look for effective strategies to close the gap.

Deaf people were also found to experience higher unemployment rates, lower wages, and a greater tendency to be employed in manual or industrial jobs. More research is needed to understand the causes of these differences, although the lower academic attainment seems to be a contributing factor.

One issue that deserves special attention is gender inequality among deaf people. Although women have achieved higher levels of education, most studies reveal that deaf women are less likely than deaf men to be in the labor

force, have higher unemployment rates, lower salaries, and less access to job promotions. This is not surprising, as it is in line with entrenched gender inequality in patriarchal societies (Gomis et al., 2023; International Labour Office, 2018). However, further research is recommended to explore this inequality and to determine whether the experiences of exclusion suffered by deaf women are comparable to those of hearing women.

Lastly, in relation to life success, there is a greater interest in aspects related to quality of life and health, with mixed results due to the limited number of studies retrieved in this review and the heterogeneity of approaches and objectives addressed.

What factors have been related to the success of deaf adults in each area?

Academic success

Environmental factors influencing academic success have received much more attention in research than personal factors. This may be due to the assumption that DHH people need external support and seek to identify what support is necessary. Alternatively, the attention to external and environmental factors could be due to the assumption that difficulties experienced by deaf people have external causes, rather than being inherent to their deafness, as suggested in the Preamble (a) of the International Convention on the Rights of Persons with Disabilities (United Nations, 2006).

The ability of DHH students to build their social capital and their self-advocacy skills seems to be key to academic success. Social capital is categorized as personal factor because it is intrinsically related to an individual's ability to build relationships and social connections with others to access resources, opportunities, and support for their academic career. Although closely related to social capital, social networks were categorized as an environmental factor. On the one hand, social networks are not always a choice of one's own, just as one cannot choose one's family. For example, the possibilities of developing social networks of DHH students in some countries are likely to be shaped by the geographical and political context in which they live. On the other hand, difficulties in accessing social networks can occur in any environment. We agree with Greene-Woods et al. (2020) that deaf role models are essential, as they have vital knowledge and experience of how to successfully navigate hearing environments.

Social capital can play a buffering role in the negative impact against the discrimination experienced by Deaf people and prepare them to cope with the challenges they face (Byatt et al., 2019; Wilkens & Hehir, 2008). Therefore, it is crucial that families and educational institutions help

deaf students to build social networks with their peers so they can develop their Deaf social capital. This is relevant because most deaf people are born into hearing families and study mainly in inclusive classrooms, especially at university level, so they are likely to lack access to deaf role models.

Family and educational services also influence academic achievement and success in many ways. It is recommended to develop collaborative synergies between both parties to comprehensively deal with the multiple challenges faced by deaf people.

Career success

Higher levels of education among deaf people were associated with greater likelihood of employment, higher salaries, and increased opportunities for career advancement within the organization. These findings are consistent with patterns observed in the general hearing population. For example, in the 38 countries belonging to the Organisation for Economic Co-operation and Development (OECD), the average employment rate gradually increases from 58% for 25–64 year olds with less than a high school degree to 93% for those with a doctoral degree or equivalent (OECD, 2022). Relative earnings of workers also increase as educational attainment rises and obtaining higher education often becomes a prerequisite for moving up the career ladder (*ibid.*).

However, we found that the level of education alone does not seem to be sufficient to close the professional gap with the general hearing population. The studies included in this review showed a variety of additional factors and barriers in the work environment, leading us to conclude that we have do not yet have a complete understanding of how deaf people achieve career success. Therefore, it would be interesting to do a more in-depth analysis to identify how factors and barriers interact with each other in the performance and career development of deaf people.

Life success

Two main factors influence the life satisfaction of deaf individuals: first, positive interpersonal relationships, particularly participation in the deaf community and the observation of role models provided by other deaf people. This could be related to a protective effect of the Deaf identity to face challenges in navigating the hearing world. This protective effect is reinforced by emotionally supportive relationships in the community (e.g., Chapman & Dammeyer, 2017; Daisy, 2008; Ma et al., 2022), in contrast to deaf people with a marginalized identity, (i.e., who do not identify

with either hearing or Deaf culture). However, the evidence found in this review is limited and more research is needed.

Second, educational attainment: A higher level of education has been associated with a higher probability of career success, expressed in terms of obtaining employment and higher wages (OECD, 2022). Higher career success, in turn, can be expected to have a positive impact on better living conditions and, hence, also to influence the self-perception of life satisfaction in deaf people in a similar way as in the general hearing population (Abele-Brehm, 2014; Drobnič et al., 2010; Hagmaier et al., 2018).

Conclusion

This scoping review found that research has focused primarily on the academic and career success of deaf and hard-of-hearing individuals, with less attention given to life success. In addition, studies have predominantly used objective measures as indicators of success, suggesting the need for more studies that include subjective measures to capture deaf individuals' perceptions of their own success.

Social capital, family support and educational services are key elements in the academic success of deaf people. Higher levels of education, especially at the university level, seem to provide better career opportunities, although they still must overcome many barriers in the work environment to close the employment gap with the general hearing population. Furthermore, there is a clear gender gap, with deaf women at a higher risk of experiencing job insecurity than deaf men.

Positive interpersonal relationships and belonging to the Deaf community may have a positive impact on the life satisfaction of deaf individuals. However, further research is needed to fully understand how deaf and hard-of-hearing individuals achieve well-being and life satisfaction.

Limitations

Most of the studies included in this review are from industrialized countries, so we lack information on how deaf people in other countries achieve success in their lives. This may be partly due to language limitations in searching for records in this review, although it may also reflect the actual lack of studies in non-industrialized countries. Although this scoping review was not intended to analyze how geographical context influences study results, future research should explore cross-country differences in outcomes and their causes.

We did not assess the quality of the evidence and/or the applicability of the results to practice or policy making.

Although this could impact on the validity of some of the findings, this decision was made based on the exploratory purpose of this review, the considerable methodological disparity of the studies included, and the fact that assessing the quality of the evidence or its applicability is not a typical aim of a scoping review. It is recommended that each area of success be further explored in more focused research.

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Declarations

Conflict of interest No potential conflict of interest was reported by the authors. The authors have no relevant financial or non-financial interests to disclose.

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