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Self-concept and self-esteem among children and young adults with visual impairment: A systematic review

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Abstract: The purpose of the study was to summarize current scientific knowledge relating to self-concept and self-esteem among children and young adolescents with visual impairment (VI). A systematic review was conducted of articles published between 1998 and 2016. A total of 26 publications, representing 15 countries, met the inclusion criteria, and 24 of the studies had used a cross-sectional design. Some studies found that the age and degree of vision loss influenced perceived self-esteem. In general, independence in mobility, parenting style, social support, and friendship was reported as important for children with VI to enhance their self-concept and self-esteem. To be able to provide opportunities for a successful development and good self-evaluation, we need more knowledge and further longitudinal observation studies and randomized clinical trials with high quality to increase the possibilities to draw conclusions about cause and effect.

Subjects: Psychological Science; Social Psychology; Developmental Psychology

Keywords: vision loss; visual impairment; self-esteem; self-concept; review

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Her main research area at NTNU is physical activity and health. Since 1994, she has also focused on mental and physical health among people with visual impairment. Statped's regional offices are responsible for providing advice and support in special education for students with visual impairment. In Norway, all students with visual impairment are fully integrated in the mainstream schools. She has published handbooks, and peer-reviewed papers in international journals, as well as the results of population-based epidemiological studies and systematic reviews in the field of vision and health.

PUBLIC INTEREST STATEMENT

How do children with visual impairment perceive their self-esteem? Children with vision loss may have reduced mobility, fewer opportunities to learn social skills, greater independency on help, and experience loneliness. Moreover, less participation in leisure-time activities with their significant others may contribute to them having an increased risk of mood disorders. Additionally, children with severe vision loss may find it hard to predict other people's behavior, reactions, and emotions from their facial expressions. A person's self-esteem may depend on their psychological adjustment, quality of life, adaptive behavior, relationships with friends, motivation and success in life, among other factors. Low self-esteem may ensue if there is a discrepancy between a person's expectations and their perception of their adequacy. Children with vision loss may have lower self-esteem due if their challenges in life differ from those of sighted children. However, the self-evaluation, social comparison, and identity of children with different visual statuses may vary.

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1. Introduction

Rosenberg (1979) and Harter (1993) both claim that a person who perceives him- or herself as competent in domains in which he or she aspires to excel will have positive self-esteem. The framework for and definition of self-esteem used by Harter and Rosenberg has much in common with the concept of self-esteem. Self-esteem can be conceptualized as the level of global regard that a person has for him- or herself as an individual (Leary & Baumeister, 2000).

Further, self-esteem may play a profound role in all aspects of a child's development (Brooks, 1992; Olsen, Breckler, & Wiggens, 2008). The term self-esteem may reflect a person's overall emotional evaluation of his or her worth and a person's sense of pride and is closely associated with his or her self-consciousness and psychological well-being (Olsen et al., 2008). This is a judgment of the self as well as an attitude toward the self. Therefore, a person's self-esteem may be dependent upon his or her psychological adjustment, the quality of life, adaptive behavior, relationships with friends, motivation, school performance, and success in life (Brooks, 1992; Papadopoulos, Metsiou, & Agaliotis, 2011; Saigal, Lambert, Russ, & Hoult, 2002). Self-esteem is often defined as the evaluative component of self-concept (Pope, Mchale, & Craighead, 1988). Low self-esteem may ensue if there is a discrepancy between a person's expectations and his or her perception of adequacy.

Alexander (1996) claims that adjusting to the social impact of vision loss requires the person to adjust positively to life's demands to maintain a positive self-concept. To facilitate the successful inclusion in society of children who are visually impaired, it is important to gain a better understanding of the psychological challenges they face. According to Tuttle and Tuttle (2004, p. 73), "the psychological principles involved in the dynamics of the development of one's self-concept and self-esteem among sighted are equally applicable to persons who are blind." However, children with visual impairment (VI) may have lower self-esteem because the challenges they face in life differ from those faced by sighted children (Alexander, 1996; Hadidi & Al Khateeb, 2013; Konarska, 2007). Roy and MacKay (2002) claim that sighted people might have more difficulties understanding people with low vision than those who are blind. Therefore, self-evaluation, social comparison, and identity may vary between children and young adults who differ in their visual status (Huurre & Aro, 1998; Pinquart & Pfeiffer, 2013). Furthermore, the self-perception of adolescents with low vision could be undermined by any negative attitudes of his or her peers, parents, and teachers.

Additionally, different countries have different school systems, cultures, and social and financial support systems for persons who are visually impaired. Some children with VI live in residential schools for the blind, while others are integrated into mainstream schools. These differences can also affect a child's perception of his or her moral, personal, physical, and social self-esteem (Bracken, 1995).

With increasing age, children naturally tend to seek more involvement with friends than with their parents or siblings, helping them to develop independence and well-being by experiencing different activities (Huurre & Aro, 1998; Olsen et al., 2008). Due to functional restrictions, especially problems with mobility and orientation, children with VI may perceive more stress in their personal and social development compared with sighted children. Their reduced ability to evaluate another person's body language may influence the reaction and feedback they encounter in some situations. Children who are visually impaired may be less socially mature and more egocentric than sighted children, since they often have difficulties observing and imitating their peers which, in turn, may interfere with their ability to develop a positive sense of self-esteem (Tuttle & Tuttle, 2004).

Saigal et al. (2002) claim that the self-esteem and social and emotional well-being of children are important domains that one should monitor closely in children considered to have higher risk of problems with adjustment. They also state: "there is now consensus that all aspects of a child's daily activities, motivation, and behavior are impacted by the child's self-esteem" (Saigal et al., 2002, p. 433). In addition, self-perception and feedback from important others are factors that affect whether the level of a person's self-esteem is high or low. Both self-concept and self-esteem play

important roles throughout all developmental phases from childhood to adult life. Beaty (1991) suggests that young people with VI have lower self-concept than their peers without VI, in a number of dimensions.

To the best of my knowledge, the peer-reviewed literature does include no review of self-concept or self-esteem among children and young adults with VI. Since peer-reviewed, published papers report mixed results, I considered it important to conduct a systematic review. Accordingly, the aim of this research and review was to summarize current knowledge of self-concept and self-esteem among children and young adults with VI.

2. Methods

2.1. Search strategy

First, I used the databases Psychology and Behavioral Sciences Collection, PsycNET, PubMed, Eric, Google Scholar, Web of Science, and MEDLINE to identify published articles on self-esteem and self-concept among children with VI. I searched the databases using the following search terms: VI, blind, low vision, self-esteem, self-concept, self-worth, and psychosocial development. Second, I conducted a manual search of the reference lists in the retrieved articles.

2.2. Criteria for inclusion and exclusion

I included studies of school-age children and young adults with VI in the age range 5–25 years. I chose the upper limit of the age range to be 25 years because many children with VI often need more years to graduate from high school than do sighted children. I restricted articles to those that: were written in English, were based on original data, had been peer-reviewed, and had been published between January 1998 and January 2014 inclusive.

I excluded articles on children and young adults with VI with comorbidity or multiple disabilities. Additionally, I excluded studies that: included only one subject, focused mainly on social support, or were duplicates. Thus, I included a total of 26 studies in the review.

2.3. Data extraction

I used a standardized protocol and abstraction form. For each publication, I recorded the first-author's name, publication year, the country in which the study had been conducted, the age and number of people in the study, the number of children with, and the number without VI in the study, the main methods for measuring self-concept and self-esteem, the definition of VI used, the school or college type, and the main results.

2.4. Evaluation of the studies

I summarized the results of my research in a table, and used the Quality Assessment Tool for Studies with Diverse Designs (QATSDD) to evaluate the 26 selected studies (Sirriyeh, Lawton, Gardner, & Armitage, 2012). The tool, which was developed to assess the quality of studies on one topic but using different approaches or designs, has been found to have good reliability and validity (Sirriyeh et al., 2012). I used the version with 14 QATSDD items related to quantitative studies. Each item was rated on a four-point scale ranging from "not at all" (0), "very slightly" (1), "moderate" (2), to "completely" (3), with a maximum score of 42. The percentage score was calculated by dividing the actual score by the maximum score (i.e. 42). Papers scoring over 75% were considered "high quality," 50–75% "good," 50–25% "moderate," and those below 25% "poor." The quality ratings are presented in Table 1.

3. Results

3.1. General results

The 26 articles included for evaluation assess either self-concept or self-esteem and the respective authors are listed in Table 1.

Table 1. Characteristics of the evaluated studies of self-esteem and self-concept

Author(s) (Publication year) Country	Methods[1]				Main results (Quality rating according to the Quality Assessment Tool for Studies with Diverse Designs (QATSSD))
	Sample	Main measurements	Definition of VI[2]	School type	
Datta and Talukdar (2016) Australia	25 VI Age: 15–25 years	Tennessee Self-Concept Scale (TSCS)	Visual acuity from 6/18 or less to 3/60 and less (blind)	Specialist and mainstream	No differences between gender and scores on self-concept. The majority of the students with VI scored low on all dimensions on self-concept (Good)
Papadopoulos (2014) Greece	84 VI 51 VI from birth 49 VI acquired at a later age Age: young adults	Rosenborg Self-Esteem Scale Rotter Internal-External Locus of Control Scale (IE-LOC)	Visual acuity, visual field, reading media, age at loss of sight, recency of vision loss 42 blind, 42 low vision	Not mentioned	The significant predictors of self-esteem were vision status, age loss of sight, recency of vision loss and educational level. Significant predictors of LOC were vision status and independent movement. Higher self-esteem among young adults with blindness compared with low vision group, and among the congenital VI group compared with those with recent vision loss or in the low vision group (Moderate)
Pinquart and Pfeiffer (2013) Germany	178 VI (24 with second disability) 526 sighted Mean age: 16 years	EIPQ[3] for identity Subscales SBSSS[4] for social support SDQ[5] for behavior problems	WHO[6] definition	DSFVI[7] RSFVI[8]	No difference in perceived identity between children. Lower perceived identity among children with congenital VI compared with children with acquired VI. Perceived identity increased with increased age. Better parental education and support from peers, fewer behavioral problems (High)
Mishra and Singh (2012) India	100 VI 100 sighted	Self-Concept Inventory by Mohsin Self-Confidence Inventory by Pandey	Not mentioned	Different schools in Delhi	Significant lower self-concept among students with VI. No significant differences in self-concept between boys and girls. The majority of students with VI had average self-confidence, but greater self-confidence among sighted participants (Moderate)
Pandith et al. (2012) India	N = 150 50 VI 50 hearing impaired 50 crippled secondary school	Sagar and Sharms Self-Concept Inventory, Shah's Level of Aspiration tool	Not mentioned	Various secondary schools	Same level of real self and aspiration among the three groups. Due to lower self-concept and level-of-aspiration scores, their achievements came out very low (Moderate)
Halder and Datta (2012) India	60 VI 100 sighted Age: 15–18 years	General Information Schedule, PHCSCS[9]	Visual acuity ≤ 6/60 or 20/200 Blind	MS[10] DSFVI	Sighted adolescents had higher overall self-concept scores compared with their blind peers, including the domains physical appearance, popularity, happiness and satisfaction (Moderate)
Halder and Datta (2011) India	60 VI 100 sighted Age: 15–18 years	PHCSCS	Visual acuity ≤ 6/60 or 20/200 Blind	MS DSFVI	Lower self-concept, including the domains physical appearance, popularity, happiness, and satisfaction in all youths with VI. Sighted male adolescents scored highest on overall self-concept (Moderate)
Kotb et al. (2011) Egypt	100 VI Age: 12–18 years	Socioeconomic Scale Rosenborg Self-Esteem Scale Quality of Life Scale	Not mentioned	El-Noor School	Children with VI from high social classes had a higher quality of life and normal self-esteem compared with other children with VI (Good)
Bolat et al. (2011) Turkey	40 VI 40 sighted Mean age: 12.8 years	Children's Depression Inventory PHCSCS Spielberger Trait Anxiety Inventory for Children	Congenital complete visual impairment	School for children with VI	Compared to sighted peers, adolescents with VI had similar depression levels and self-concept characteristics, but higher anxiety levels (Good)

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Table 1. (*Continued*)

Author(s) (Publication year) Country	Methods[1]				Main results (Quality rating according to the Quality Assessment Tool for Studies with Diverse Designs (QATSSD))
	Sample	Main measurements	Definition of VI[2]	School type	
Were et al. (2010) Kenya	291 VI 210 partially sighted 81 totally blind Class eight	Self-Description Questionnaire Individual Evaluation (SDQI) Academic Achievement Test (AAT)	Snellen Chart	168 special school,82 integrated in MS, 28 inclusive program	Girls scored higher than boys on self-concept and hence in achievement tests than their male counterparts among pupils with VI. Student with higher self-concept scored higher on achievement. Pupils who were totally blind had lower self-concept than pupils with low vision (High)
Bowen (2010a) United Kingdom	60 VI Age: 6–14 years	B/G STEEM[11] for self-esteem and locus of control	Snellen Chart 1/120 defined as severe VI, 6/9 defined as mild VI	MS	Self-esteem of the majority of children with VI: normal or high level. Higher self-esteem in girls compared to boys. Degree of VI and age may affect self-esteem (Moderate)
Bowen (2010b) United Kingdom	4 VI Age: 7–12 years	B/GSTEEM for self-esteem	Snellen Chart	MS	Six months' educational intervention over half of a school term improved the self-esteem of children with VI who had low or very low self-esteem from baseline (Moderate)
Garaigordobil and Bernarás (2009) Spain	29 VI 61 no VI Age: 12–17 years	LAEA[12] RSES[13] SCL-90-R[14] NEO-FFI[15]	VI: 24% vision level between 0.4 and 0.3, 28% between 0.25 and 0.12, and 35% 0.1 or less Eye diagnostic test	Centre of Resources for the Educational Inclusion (CRI) MS	No significant differences in self-concept and self-esteem, but the children with severe VI scored significantly higher in psychopathological symptoms. Girls with severe VI scored lower in self-esteem. Higher scores on self-esteem: correlated with higher scores on extroversion. Low psychoticism, high extravertion, and low hostility were identified as predictors of high self-concept (High)
Shapiro et al. (2008) United States	43 VI 9 B1—Athletes 7 B2—Athletes 14 B3—Athletes 13 unknown –33 Age: 8–14 years –10 Age: 15 years and over	Self-Perception Profile for Children (SPPC) and Adolescents (SPPA)	Snellen Chart and assessment of field of vision United States Association of Blind Athletes definition	Participants attended a one week summer camp for individuals with VI	Children with VI discounted the importance of physical appearance, athletic competence, and social acceptance and had moderately high ratings on global or overall self-worth (High)
Al-Zyoudi (2007) Jordan	23 low vision Age: 12–17 years	TSCS[16] Minnesota Multiphase Personality Inventory (MMPI)	WHO definition	MS	Youths with VI had higher self-concept in physical appearance and performance, lower self-concept in social relation, family involvement, moral and behavior to self for girls compared to boys (Good)
Lifshitz et al. (2007) Israel	40 VI 41 sighted Age: 13–18 years	"I am/He is" an Israeli Questionnaire Nottingham Adjustment Scale Quality of Friendship Scale	US definitions (National Eye Institute, 2002)	20 RSFVI 20 VI in Public School	Similar self-concept profile for the adolescents (High)
Shapiro et al. (2005) United States	43 VI 9 B1—Athletes 7 B2—Athletes 14 B3—Athletes 13 unknown 33 Age: 8–14 10 Age: 15 years and over	Self-Perception Profile for Children (SPPC) and Adolescents (SPPA)	Snellen Chart and assessment of vision field The definition from the US Association for Blind Athletes	Participants attended a one week summer camp for individuals with visual impairment	Differences in the perceived competence of the girls, but not the boys, after they attended one-week summer camp. No differences in the perceptions of competence with age (High)

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Table 1. (*Continued*)

Author(s) (Publication year) Country	Methods[1]				Main results (Quality rating according to the Quality Assessment Tool for Studies with Diverse Designs (QATSSD))
	Sample	Main measurements	Definition of VI[2]	School type	
Griffin-Shirley and Nes (2005) United States	71 VI 88 sighted Age: 8–14 years	CSEI[17] short form for self-esteem IECA[18] for empathy CABS[19] for bonding with pets	The best correction of VI still affects educational performance	RSFVI	No differences in self-esteem, empathy toward others, and bonding with pets between children (High)
Roy and MacKay (2002) Scotland and United Kingdom	16 blind or low vision Age: 18–34 years (mean age 23 years)	Twenty Statements Test (TST) (self-perception) IELOC	Self-definition	College	A generally positive view of self-emerged, but negative TST responses focusing on disability occurred, sometimes associated with deteriorating vision loss and recency loss. Highly external LOC responses. Experience low vision may be more fraught with anxiety and self-evaluation and identity than blindness (Moderate)
Kef (2002) Netherlands	316 VI (60 blind, 58 severe VI, 198 moderate VI) 495 sighted Age: 14–24 years	Rosenberg Self-esteem Scale (RSES) Locus of Control Construct[20]	Functional Vision Scale	RSFVI	The adolescents with VI reported a slightly higher level of self-esteem, and more difficulties to make friends (High)
Lopez-Justicia et al. (2001) Spain	58 congenital low vision 58 sighted Age groups: 4–7, 8–11, and 12–17 years	PAI[21] for age 4–7 years SCSDQ[22] for age 8–11 yearsTennesse Self-Concept Scale (TSCS) for age 12–17 years	WHO definition	MS	Lower self-esteem among children with congenital low vision compared to sighted (Good)
Cardinali and D'Allura (2001) United States	31 VI Age: 18–23 years 17 mothers	Parental Autority Qusetionnaire (PAQ for parenting style (self-report and report from mothers) TSCS	Not mentioned	Finished school	Parenting style related to children's self-esteem (High)
Huurre et al. (2001) Finland	115 VI607 sighted controls Age: 12–17 years	Beck Depression Inventory Self-esteem Scale developed for Finnish school students, scales for relationships	Ophthalmological information from the Finnish Register of Visual Impairment	MS	The impact of relationships with friends on depressive symptoms was mediated through self-esteem. Unlike the controls, relationship with parents was not an explanatory factor of depression in adolescents with VI (High)
Gronmo and Augestad (2000) Norway and France	8 Norwegian and 12 French (blind), 41 Norwegian and 43 French (controls) Age: 13–16 years	Shortened versions HSPPA[23] for Self-Concept and Global Self-Worth	14 born blind and the rest became blind later in life	MS: Norway DSFVI: France	School type or country had no influence on the reported self-concept and global self-worth. Significant differences in global self-worth between blind and sighted youths (Good)
Rosenblum (2000) United States	10 adolescents with VI 23 sighted friends (of the 10 adolescents)	Semi-structured interviews and quantitative data	Self-reported low vision or functionally blind	MS	Heterogeneity of the population of adolescents with VI in their experiences of VI and perceptions of how VI affected their lives. Adolescents with VI felt excluded and that had a negative impact on their self-esteem and self-worth (Good)

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Table 1. (*Continued*)

Author(s) (Publication year) Country	Methods[1]				Main results (Quality rating according to the Quality Assessment Tool for Studies with Diverse Designs (QATSSD))
	Sample	Main measurements	Definition of VI[2]	School type	
Huurre et al. (1999) Finland	115 VI 607 sighted Age: 12–17 years	Finnish 5-point scale for self-esteem and social relationships	Braille users defined as blind	MS	Friendship improved self-esteem for children with VI. Lower self-esteem among girls with VI. No difference in self-esteem between boys with VI and boys without VI. No influences of severity of VI or onset of VI on the self-esteem of children with VI (High)

[1]All studies were cross-sectional studies except for the one by Bowen (2010b).

[2]VI: visual impairment.

[3]EIPQ: Ego Identity Process Questionnaire.

[4]SBSSS: Support Berlin Social Support Scales.

[5]SDQ: Strength and Difficulties Questionnaire.

[6]WHO: World Health Organization.

[7]DSFVI: day school for children with VI.

[8]RSFVI: residential school for children with VI.

[9]PHCSCS: Piers-Harris Children's Self-Concept Scale.

[10]MS: mainstream schools.

[11]B/G STEEM questionnaire: Self-esteem Scale with Locus of Control Items by Maines and Robinson.

[12]LAEA: Adult and Adolescent Self-Concept Adjective Checklist.

[13]RSES: Rosenberg Self-Esteem Scale.

[14]SCL-90-R: Symptom Checklist-90-Revised.

[15]NEO-FFI: Neo Five-Factor Inventory.

[16]TSCS: Tennessee Self-Concept Scale.

[17]CSEI: Cooper smith Self-esteem Inventory.

[18]IECA: Index of Empathy for Children and Adolescents.

[19]CABS: Companion of Animal Bonding Scale.

[20]Coping.

[21]PAI: Perception del Autoconcepto Infantil.

[22]SCSDQ: Self-Concept Scale of the Self-Description Questionnaire.

[23]HSPPA: Harter's Self-perception Profile for Adolescents.

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3.2. Study characteristics

All of the evaluated articles report results from observational studies with a cross-sectional design, except for two that report results of interventional studies (Bowen, 2010b; Shapiro, Moffett, Lieberman, & Dummer, 2005). The study conducted by Bowen included a six-month educational intervention for four children with VI, and the study conducted by Shapiro et al. included 43 children with VI who attended a one-week summer camp. The articles were conducted in 15 countries. Most studies included only a small number of subjects, although 7 of the 26 studies included more than 100 participants with VI (Huurre, Komulainen, & Aro, 1999, 2001; Kef, 2002; Kotb, Gadallah, & Marzouck, 2011; Mishra & Singh, 2012; Pinquart & Pfeiffer, 2013; Were, Indoshi, & Yalo, 2010). The age range of the participants, school type, definition of VI, and outcome measurements differed from study to study.

3.3. VI compared with no VI

Five studies showed that children and young adults with VI scored lower on self-concept and self-esteem than did children without VI (Gronmo & Augestad, 2000; Halder & Datta, 2012; Lopez-Justicia, Pichardo, Amezcua, & Fernandez, 2001; Mishra & Singh, 2012; Rosenblum, 2000). On the other hand, seven studies did not find these differences (Bolat, Dogangun, Yavuz, Demir, & Kayaalp, 2011; Garaigordobil & Bernarás, 2009; Griffin-Shirley & Nes, 2005; Huurre et al., 1999; Konarska, 2007; Lifshitz, Hen, & Weisse, 2007; Pinquart & Pfeiffer, 2013). However, Kef (2002) found that adolescents with VI reported slightly higher levels of self-esteem than the sighted adolescents. Shapiro, Moffett, Lieberman, and Dummer (2008) report that children with VI had moderately high ratings of global self-worth. Pandith, Malik, and Ganai (2012) concluded that children with VI in secondary school had same level of self-esteem and aspiration as children with hearing impairments and children who were crippled.

3.4. Gender

With regard to self-esteem and self-concept, Bowen (2010a) and Were et al. (2010) found that girls with VI had better scores than boys with VI, but two other studies did not find gender differences (Datta & Talukdar, 2016; Mishra & Singh, 2012). By contrast, Al-Zyoudi (2007) found that compared with boys with low vision, girls with low vision scored higher on self-concept regarding their physical appearance but lower on self-concept in social relationships. Shapiro et al. (2005) found that girls with VI had lower perceptions of their competence than boys with VI, and although the girls' perception of competence increased after a one-week summer camp, the boys still scored higher on competence than the girls. Three studies from Finland showed that girls with VI had lower self-esteem than girls without VI, while boys with VI seemed to be well adjusted with respect to their self-esteem (Huurre & Aro, 1998, 2000; Huurre et al., 1999). Huurre and Aro (2000) claim that the findings are indicative of different coping mechanisms or different ways of expressing health differences between boys and girls. This finding is in line with results reported by Halder and Datta (2011).

3.5. Severity and age of onset

Two studies found that the severity of children's VI did not influence their self-concept (Huurre et al., 1999; Pinquart & Pfeiffer, 2013); by contrast, four studies found the opposite results for self-esteem (Bowen, 2010a; Garaigordobil & Bernarás, 2009; Papadopoulos, 2014; Were et al., 2010). Pinquart and Pfeiffer (2013) found that children with congenital VI scored lower on self-identity than children with acquired VI, while Papadopoulos (2014) found the opposite results. The results of the study conducted by Roy and MacKay (2002) showed that young adults with low vision had poorer self-evaluation and identity than those who were blind. Huurre et al. (1999) found that the onset of VI did not influence the self-esteem of children with VI compared to peers with VI.

3.6. Age, parenting style, behavioral problems, and school system

The self-esteem or self-concept of children with VI might have been affected by their parents' education (Pinquart & Pfeiffer, 2013), parenting style (Cardinali & D'Allura, 2001), higher social class (Kotb et al., 2011), age (Pinquart & Pfeiffer, 2013), and whose other children had problem behaviors (Lopez-Justicia et al., 2001; Pinquart & Pfeiffer, 2013). Different school systems did not affect the self-concept of children with VI (Gronmo & Augestad, 2000).

3.7. Social support and friendship

Social support, especially friendship (Huurre et al., 1999, 2001; Shapiro et al., 2008), seemed to be important for enhancing the self-esteem or self-concept of children with VI. Al-Zyoudi (2007) concluded that, compared with boys with low vision, girls with low vision had lower scores on self-concept in social relations. Bowen (2010b) conducted an educational intervention study of children with VI who had low self-esteem. Her results showed that interventions that included more cooperative teaching ("circle time" and "circle of friends") and more learning in the classroom had a positive effect. The scores on self-esteem increased.

4. Discussion

Due to different research purposes, study designs, samples, cultures, and the use of different measurements to evaluate self-concept and self-esteem, the results of the studies were inconsistent. However, friendship, independence in mobility, social support, and parenting style all seemed to be important for enhancing the self-concept and self-esteem of children with VI. Girls with VI appeared to have less self-esteem and a lower sense of self-concept compared with boys with VI. Children with VI may have fewer opportunities to make friends than sighted children and they may face more social isolation. As a possible consequence, they may develop emotional and communication problems (Kef, 2002). Overprotection could leave them feeling less attractive and competent, and consequently they could experience additional frustration and emotional or behavioral problems (Huurre & Aro, 1998, 2000).

Good social support, especially support from friends, may help to improve self-concept and self-esteem among children with VI (Lopez-Justicia et al., 2001; Pinquart & Pfeiffer, 2013). Opportunities for children with VI to join leisure activities and other social activities with friends are especially important (Huurre & Aro, 2000). Griffin-Shirley and Nes (2005) claim that the development of self-esteem among children and youths with VI requires an environment that provides freedom to explore and protection from danger. Self-confidence in one's abilities is important, and therefore adults or friends need to help children with VI to find suitable leisure-time activities.

The reported importance of the degree of vision loss differed between the studies. However, most of the studies didn't separately analyze children with mild VI. Lack of information for children with mild VI may therefore have biased some conclusions. Nevertheless, the degree of vision loss and the prognoses of the disease may interfere with evaluations of self-esteem. The inclusion of children with VI in mainstream schools did not seem to have a negative influence on their self-esteem (Gronmo & Augestad, 2000). In some countries, parents may send their child to a school for the blind, but in other countries, the only option may be a mainstream school. The results of the study conducted by Kef (2002) showed that adolescents with VI reported higher self-esteem than sighted adolescents. One reason for those results may be that, of the sample of 316 children with VI, 198 had moderate VI and attended residential schools for children with VI in the Netherlands. Children and youths in residential schools may develop more friendships with each other, and there may be similarities in the way they perceive social acceptance and evaluations of appearances. Perceived lack of these domains may reduce healthy feelings of self-worth.

Some researchers suggested that parents and teachers played important roles in the development of identity, moral judgment, social interaction, and physical self-behavior among children with VI (Bowen, 2010b; Cardinali & D'Allura, 2001; Pinquart & Pfeiffer, 2013). The link between perceived acceptance and self-esteem may be important. Additionally, domain-specific competence, such as academic, social, athletic, physical, and behavioral competence, may differ in relation to age, gender, and diagnoses.

4.1. Limitations

The aims, study design, participants, and measurement methods differed between the evaluated 26 studies. The studies also differed with respect to the ages of their participants and in the measurements of self-esteem and self-concept, which thus complicated comparisons. The presence of additional disabilities and the economic and cultural status of the participants in each study were not taken into account. However, despite the extensive literature on studies with sighted participants,

research on self-concept and self-esteem may be flawed due to ambiguous definitions of the construct and lack of adequate instruments with which to measure it (Saigal et al., 2002).

A further limitation was that different definitions of VI were used in the studies. The majority of the publications (22) do not mention the diagnoses, progression of the disease, or the onset-age of vision loss, yet increasing severity of visual losses may lead to lower scores on self-concept and lower self-esteem (Bowen, 2010a).

In most studies, the age range of the participants was wide, which may have affected the results. Children's emotional or behavioral performances differ according to different age and development stages (Papadopoulos, 2014; Pinquart & Pfeiffer, 2013). Therefore, the different results for self-esteem and self-concept for children with VI may have been partly due to normal psychological development with increasing age for the studied children.

In addition, the majority of the studies evaluated were small, and limited to a specific geographical area; only 7 studies included more than 100 children with VI. All of the studies had a cross-sectional design, except for three interventional studies (Bowen, 2010b; Shapiro et al., 2005, 2008). Therefore, the results could not be synthesized in a meta-analysis because of the small number and heterogeneity of the included studies. I suspect that bias due to selection or confounding may have occurred in at least some of the studies (e.g. Al-Zyoudi, 2007; Bowen, 2010b; Datta & Talukdar, 2016; Roy & MacKay, 2002; Shapiro et al., 2005, 2008). I strongly suspect there was bias in the studies that lacked randomization, especially those that included only a small convenience sample of children with VI. Unfortunately, many studies used this approach to obtain a more homogeneous sample. Thus, the study subjects may not have represented the target population. Conclusions of some studies might not have been accurate in the cases where selection bias was not taken into account.

5. Conclusions

The lack of longitudinal observational studies and randomized clinical trials limits the ability to draw conclusions about cause and effect. Some studies found that age and degree of vision loss influenced perceptions of self-esteem in children and young adults with VI. Social support, friendship, independence in mobility, and parenting and teaching style seemed to be important for helping children with VI to enhance their self-concept and self-esteem. In order to provide opportunities for successful development and healthy self-evaluation for children and young adults with VI, we need more knowledge and additional longitudinal and randomized studies of high quality.

5.1. Implications for practitioners

The findings may have implications for the education of children with VI as well as the provision of services for them. To achieve a good self-esteem and self-concept, it is important for children with VI to have more experiences of cooperation, independence in mobility, and more opportunities to attend activities with their peers. Furthermore, there is a need for a better understanding of the emotional and social needs of children with VI, in order to improve their self-esteem and to enhance their psychological self-evaluation and well-being. In a successful development process, all children can develop and become well adjusted, emotionally balanced individuals who have a positive perception of their self-esteem.

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