Social Interactions and Friendships of adolescents with vision impairments: 
A scoping review

One year Master Thesis

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ABSTRACT

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Background: Social exclusion of people with vision impairments is an ongoing issue. Since social inclusion emphasizes social and emotional aspects as distinct from academic ones and the aspects concerning opportunities, the focus is turned on the domain of social interactions and friendships. Adolescence is the time point when youth feels mostly the need to ‘fit in’ in social circles and groups and the social life and friendships are important aspects of young people’s well-being and development.

Aim: The aim of this study is to review the existing literature on the social interactions and friendships of adolescents with visual impairments from their own perspective and investigate the interventions designed to improve their social interactions and friendships.

Method: A literature search on the databases of ERIC, CINAHL and PsycINFO and a hand search on the reference lists of the relevant articles was conducted. The search was limited to recent peer reviewed studies published in English, reporting perspectives of adolescents (13-18 years old) with visual impairments on their social interactions and friendships and intervention studies aimed to support them in the aforementioned domain.

Results: In the 18 included studies, adolescents with vision impairments engaged more in passive activities that were not highly interactive. They reported being satisfied with their networks and friends, however contradictions existed in the perceived quality of friendships and the feeling of loneliness. The context of school was presented often as problematic compared to other contexts, and friendships in schools were rare. According to adolescents’ voices, friendships helped to cope with the impairment, friends had a meaningful role in their life and they made school life more enjoyable. In comparison to their sighted peers, adolescents with vision impairments had smaller networks and less friends with whom they had different type of
relationships. Lastly even though several barriers and facilitators were identified, which belong to domains of Body functions and structures and Physical, Attitudinal and Social environment, there was a lack of interventions aiming to support the social interactions and friendships of adolescents with vision impairments.

**Conclusions:** Considering the importance of social interactions and friendships in adolescents’ life for them to learn, develop and enjoy, more interventions with social focus need to be designed in respect to the challenges that exist. A plethora of barriers and facilitators impacting the social interactions and friendships of adolescents with vision impairments were identified that need to be taken into consideration for future research and interventions since the existing literature provided so far is limited. Adolescents need to be engaged in this process so that their interests, preferences and their views are prioritized.

Keywords: social interaction, social inclusion, friendships, adolescents, vision impairment, blindness, low vision, scoping review

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<th>Telephone</th>
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</tr>
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<tr>
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<td>036–101000</td>
<td>0361625 85</td>
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1. Introduction

Social exclusion of people vision impairments is an ongoing issue even though the scientific community has intensely and constantly been researching how to preserve the rights of people with disabilities already since 2006 when the Convention on the Rights of Persons with Disabilities was adopted by the United Nations (UN, 2006; UNICEF Innocenti, 2007; Jones, Presler-Marshall, & Stavropouloy, 2018; Nollett et al., 2019; Elsman, van Rens, & van Nispen, 2019). Sensory impairments affect functioning ability in all life domains and, as suggested by recent research evidence, vision impairments are related to social isolation and reduced quality of life (Nollett et al., 2019; Elsman, van Rens, & van Nispen, 2019). Social development is undoubtedly a necessary aspect of a person’s life and general development, especially for children and youth (Rosenbaum & Gorter, 2012) since humans are “social animals and are attracted to other humans more than to most other stimuli in the environment” (Hektner, Schmidt, & Csikszentmihalyi, 2007, p.280).

Social interactions and friendships affect the person’s activities, participation and functioning and thereby their health condition (WHO, 2007). Notably health condition does not only include the biological and physical aspects, but also the psychological and social well-being (art.25 UN, 2006) and the domain of activities and participation which includes the interpersonal interactions and relationships (WHO, 2007).

In the light of the above arguments, it is undoubtable that social exclusion hinders the social development of individuals with vision impairments and therefore affects their general developmental outcomes, well-being and quality of life (Hektner, Schmidt, & Csikszentmihalyi, 2007). For this reason more research needs to be made that would highlight the barriers and facilitators that affect participation, functioning and quality of life of people with vision impairments, a domain that has not received enough scientific consideration, especially for children and youth (Chak & Rahi, 2007; Chadha & Subramanian, 2011).

1.1 Vision Impairments

According to the World Health Organisation (WHO, 2017), vision impairments affect approximately 1.3 billion people worldwide. Vision impairments are classified in mild,
moderate, severe vision impairments and blindness and the different levels of them impact the everyday life of people differently (WHO, 2017). The percentage of people affected and the causes vary, while, the healthcare and eye care systems across continents, countries - and even regions, is reported to have major effect (Bourne et al., 2017; Flaxman et al., 2017; Kocur & Resnikoff, 2002; WHO, 2017).

1.2 Vision impairments and Functioning: Theoretical models

The prevalence of vision impairments and blindness as well as their causes\(^1\) are differentiated between ages (Flaxman et al., 2017; Kocur & Resnikoff, 2002). Compared to adults, the percentage of children and youth affected by VI is much lower (WHO, 2017), especially in Europe where 0.1-0.41 per 1000 children and youth is affected (Kocur & Resnikoff, 2002). More specific evidence for children and youth between 0 to 14 years of age shows that globally 10.24 % have visual impairments, 9.47% of which have low vision and 0.76% are blind (Pasolini & Mariotti, 2012).

Different models of understanding disability were developed in order to identify the restrictions that people with disabilities face (Peterson, Mpofu, & Oakland, 2010). Since 2001, the attention was drawn from the biomedical model focusing on health conditions and body functions, to the biopsychosocial model of understanding disability. In this later model *disability is meant to focus on the individual, societal and body-related aspects of impairments, activity limitations and participation restrictions in the environment* (Peterson, Mpofu, & Oakland, 2010, p. 8).

This shift of focus was further established when the world health organization introduced the international classification of functioning (ICF). In ICF the importance of everyday functioning, activity and participation in real life situations is highlighted (WHO, 2007). In ICF’s framework there are several components related to the health condition that interact with each other according to the followed diagram (*Figure 1*):

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\(^1\) Refractive error, cataract, age related macular degeneration, glaucoma and diabetic retinopathy are the most common causes of vision impairments for adults in Europe and worldwide (Flaxman et al., 2017; Kocur & Resnikoff, 2002).
In this context Body functions are the physiological and psychological functions of body when Body structures refer to the anatomical parts. Activity is the execution of a task or action and Participation is involvement in life situations. Those components are impacted by personal factors (which are not classified in ICF due to their broad nature) and environmental factors related to the physical, social and attitudinal environment that people live in. The functioning and disability factors: body functions and structures, along with the environmental factors can either work as barriers which indicate disability (impairments, activity limitations or participation restrictions), or can facilitate aspects of health and functioning (WHO, 2007).

Rosenbaum & Gorter (2012) in an attempt to incorporate the ICF framework in everyday life of children and youth in a more simple and appealing way, identified five “F-words” (see Figure 2). These five words are Function, Family, Fun, Friends and Future and according to these words the life situation and health condition of individuals with vision impairments, especially adolescents, will be presented below.
1.3 F-words and Vision Impairments

Function or functioning is a term consisting of the components of carrying out task - activity, and involvement in life situations, i.e. participation (WHO, 2007). There are different types of factors that affect what an individual can do and what the individual chooses to do, not only based upon the body functions and structures but also upon the specific context (WHO, 2007; Rosenbaum & Gortier, 2012). Therefore, the impact of vision impairment (VI) on a person’s functioning is not the same in adults and children or adolescents, not only due to the cause of the impairment but also the way it impacts and is affected by contextual factors like the family, support networks and peers (Chadha & Subramanian, 2011).

In the first years, vision is the sense that affects the way the child interacts, moves, explores and learns (WHO, 2019; Chak & Rahi, 2007). VI influences the health, welfare and development of the child (Chak & Rahi, 2007). As the years go by, vision is important for entering education and it affects people’s every-day functioning, social life, leisure activities, ability to work and generally to be independent (WHO, 2019; Elsman, van Rens, & van Nispen, 2019). This automatically affects the f-word of Future since development is an ongoing process full of transitions across the lifespan (Rosenbaum & Gortier, 2012).
**Family**, as mentioned above, belongs to the contextual factors with a large impact in child’s development as it is the system closest to the child (see Bronfenbrenner & Ceci, 1994). Several developmental models emphasize the impact of the family and its characteristics on child’s development (Guralnick, 2001; Sameroff & Fiese, 2000). Having a child with disability such as VI can cause a lot of stress to the family and can potentially generate restrictions to the child and the family as a whole (Guralnick, 2001; Rosenbaum & Gorter, 2012). One relevant example provided by Hatlen (2004) on how family can affect the child’s social inclusion and development is the decision that parents make on whether their visually impaired child or adolescent will attend an inclusive school or a school for blind.

**Fitness** stands for the importance of physical activity and participation for the person’s wellbeing. It is logically connected with the aspect of activity and participation and therefore, a lot of contextual factors that have a major role in this domain. For people with VI and specifically adolescents with low vision or blindness, the general view is that they tend to stay alone choosing more ‘passive’ activities that does not include other people, such as listening to music and also dedicate a lot of time to sleeping (Wolffe & Sacks, 1997). This behavior causes concerns as it is through activities and interactions with other humans that individuals with vision impairments manage to overcome some of their limitations caused by their impairment and develop a better understanding of the world (Roe, 2008). Considering these reports, it can be deducted that the impact of vision impairment in the psychosocial domain is greater than the impact on the physical domain of adolescents’ with VI life (Chak & Rahi, 2007).

However, it is not only about doing and accomplishing things but also about enjoying things and this is what the word of **Fun** is all about. There are a lot of assessments developed in order to measure the enjoyment described above and also to assess the quality of life of people with disabilities (Rosenbaum & Gorter, 2012; Boulton, Haines, Smyth, & Fielder, 2006). A common conclusion from previous studies is that vision impairments negatively affect adolescents general well-being and quality of life (Chadha & Subramanian, 2011; Wong, Machin, Tan, Wong, & Saw, 2009; Chak & Rahi, 2007). Children and youth with visual impairments, in their pre-teen and teen years are reported to have poorer quality of life (Chadha & Subramanian, 2011). Considering the fact that in most cases the majority of them have been completely supported by habilitation services (Chadha & Subramanian, 2011), questions about
which factors affect and predict the quality of life in this population arise (Chadha & Subramanian, 2011).

One of the factors that seems to be strongly connected to the quality of life of adolescents, is the importance of peer relationships and friendships. Time spent with peers and friends has a major impact on adolescents’ feeling of excitement and positive emotions and therefore researchers include that aspect in measures of quality of experience and quality of life (Hektner, Schmidt, & Csikszentmihalyi, 2007).

The final f-word, **Friends** is considered to be a factor on which a lot of emphasis should be put onto, as it is a highly important aspect of human life and development (Rosenbaum & Gorter, 2012). In a study by Csikszentmihalyi and Larson (Hektner, Schmidt, & Csikszentmihalyi, 2007), it was reported that adolescents spend more than half of their time, when not sleeping, with their peers. As the period of adolescence is characterized by a plethora of changes in psychosocial development, it is the time point when youth feels mostly the need to ‘fit in’ in social circles and groups (Kef, 2002) especially with similar others (Koutsouris, 2014). Their social life at school is an important aspect of young people’s well-being and also a major factor for inclusion at school (Worth, 2013).

Adolescents with VI, tend to have smaller friend networks and be lonelier than their sighted peers (Wolffe & Sacks, 1997; Kef, 2002). This has a great negative impact on adolescents’ well-being and it is not only the quantity of friendships that affect individuals’ well-being but also the quality (Rosenbaum & Gorter, 2012). It is not common for research to examine friendship quality, due to multiple ethical considerations, but friendships and peer support is crucial for the quality of long-term social networks of adolescents with VI (Kef, 2002).

In conclusion, the domain of socialization and friendships, undoubtedly, has a high impact on youth with VI. Thorough literature searches are needed to gain further understanding of adolescents with VI, their social interactions and friendships and how they can be supported. This would consequently positively affect the aspects of fun, fitness, functioning, family and future. This study will be an attempt to investigate further these domains.
1.4 Rational

Evidence about the social interactions and the quality of life of people with vision impairments is limited and infrequent (Chak & Rahi, 2007). In existing evidence, adults are usually the main focus (because of the higher prevalence), and only a few studies focus on adolescents (Elsman, van Rens, & van Nispen, 2019; Chadha & Subramanian, 2011; Chak & Rahi, 2007).

Investigating vital components of the quality of life, social interactions and friendships (Hektner, Schmidt, & Csikszentmihalyi, 2007), for adolescents with VI is important. Not only for covering gaps in literature, but it is also highly demanded considering previous studies’ results that report a greater impact on the psychosocial domain than the physical domain of their lives (Chak & Rahi, 2007).

In the global evidence of 2018 for the challenges that adolescents with disabilities face, no access to friendships was a major issue reported (Jones, Presler-Marshall, & Stavropouloy, 2018). Interactions and relationships with peers especially without disabilities is a way for them to gain information and experiences crucial for their transition to adulthood and achieve informal learning. (UNICEF Innocenti, 2007). Additionally, another study’s results mention that adolescents and young adults with impairments, such as vision impairments, are at a higher risk of social isolation (UNICEF Innocenti, 2007) and youth around 18 years of age with vision impairments was reported to have significant higher risk for depression because of it (Nollett et al., 2019).

2. Purpose of the study

The initial aim of this study is to explore the social interactions and friendships of adolescents with VI from their own perspective. Hearing the voices and lived experiences of adolescents from their own perspective is important as only they are aware of the full extent of the impact of the impairment in their life (Chak & Rahi, 2007). Additional aim of this study is to investigate the available interventions aimed to support the social interactions and friendships of adolescents with vision impairments.

Research questions are:
1. What evidence exists about the social interactions and friendships of adolescents with VI?
2. What evidence exists about adolescents’ with VI interactions and friendships in comparison to their sighted peers?
3. What evidence exists about the barriers and facilitators of the social interactions and friendships of adolescents with VI?
4. What evidence exists about the interventions designed to support social interactions of adolescents with VI?

The first aim of this scoping review is formulated according to PICo guidelines and the second aim is following the PICO, as presented in Table 1 (Stern, Jordan, & McArthur, 2014).

Table 1

*Application of PICo and PICO*

<table>
<thead>
<tr>
<th>Population</th>
<th>Interest</th>
<th>Context</th>
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</thead>
<tbody>
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<td>Adolescents with vision impairments</td>
<td>Social interactions and friendships from adolescents’ perspective</td>
<td>home, school, other contexts</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Population</th>
<th>Intervention</th>
<th>Comparison</th>
<th>Outcome</th>
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<tbody>
<tr>
<td>Adolescents with vision impairments</td>
<td>Interventions aimed to support social interactions and friendships</td>
<td>no intervention or other type of support for social interactions and friendships</td>
<td>improved social interactions and friendships</td>
</tr>
</tbody>
</table>

3. Method

3.1 Study design-Scoping Review

In order to review relevant literature on the topic, summarize empirical research, identify key concepts and gaps in knowledge and point out a way for a future research, a scoping review of contemporary literature (2000-2019) was chosen as the most
appropriate method (Arskey & O'Malley, 2005; Jesson, Matheson, & Lacey, 2011). A scoping literature review was considered as the most ideal one as the aim of this study belongs to a scientific domain that is not comprehensively reviewed (Chak & Rahi, 2007; Chadha & Subramanian, 2011). Thus, the existing evidence is heterogeneous, is resulted from a variety of studies with different designs and methodologies and is not adequate for a more precise systematic review where the inclusion and exclusion criteria are stricter (Peters, Godfrey, Khalil, McInerney, Parker, & Soares, 2015).

Moreover, scoping reviews can address research questions, similar to the ones set for this study, which are beyond the ones that are only related to the effectiveness of interventions (Peters et al., 2015). Lastly, since scoping reviews are narrative and descriptive in nature, they aim to gather a considerable amount of evidence and do not formally assess methodological quality of the included studies unlike systematic reviews (Arskey & O'Malley, 2005; Peters et al., 2015).

Once the research questions were established, next step was to identify relevant studies, complete the selection of studies meeting specific selection criteria. In this scoping review only peer reviewed published material, which add credibility to the study, were taken into consideration even though the nature of the study would allow grey literature to be included as well (Peters et al., 2015).

A protocol, was established in order to chart the data and summarize/organize the results of the included studies into themes and consequently report the results in the last step (Arskey & O'Malley, 2005).

### 3.2 Document searching strategy

In order for the scoping review to be as comprehensive as possible, a searching strategy on electronic databases and reference lists of included articles was chosen.

An electronic search took place in February 2019, in the databases ERIC, PsycINFO, CINAHL which were accessed through Jönköping University’s electronic library in order for literature to be derived. The mentioned databases were chose as they provided the most relevant (social, health and education related) results for the aim of this study.
3.3 Searching strategy

For the searching strategy different combinations of thesauri, MeSH terms, and free text terms retrieved from relevant literature were tried. The searching strategies were finalized when they derived a plethora of relevant articles and there were no new terms provided in relevant literature.

Specifically, the searching strategy implemented for ERIC and CINAHL, according to thesaurus and free text terms was:

("Vision Disorder*" OR "Visual Impairment*" OR Blindness OR "Vision Loss") AND (Child* OR Adolescent* OR Youth OR Teenager* OR students) AND (Interaction* OR "Social Interaction*" OR "Social Isolation" OR "Interpersonal Relations" or "Peer Relations*" OR "Interpersonal Relationship*" OR Friend* OR "Peer Relationship*" OR "Social Life")

For PsychINFO according to thesaurus and free text the searching strategy was:

(Blindness OR "Vision disorders" OR "vision impairment*" OR "visual impairment*") AND ("Social Interaction" OR "Interpersonal interaction" OR "Peer relations*" OR "Social isolation").

3.4 Criteria of inclusion/ exclusion

To minimize the studies to those addressing the research questions and exclude irrelevant ones, inclusion and exclusion criteria were developed.

Firstly, as this study aimed to derive contemporary literature, only articles published after 2000 were included. For practical reasons the language of publication was only English, as other languages were not possible to be translated in this limited time. Criteria were set already at the database search level as ERIC, PsycINFO and CINAHL offer the opportunity to narrow down the results depending on their year of publication, the language of publication and whether they were peer reviewed.

Since there was emphasis put in the importance of adolescents’ own opinion on the topic, the selected studies needed to include adolescents aged 13 to 18 years old as participants whilst other studies based only on parents’ or professionals’ opinions were excluded.
Lastly, studies where the whole population of adolescents had additional diagnoses along with visual impairment and blindness, were excluded as well since additional diagnosis would be connected to additional barriers in their social interactions. In Table 2 all inclusion and exclusion criteria are presented.

Table 2

**Inclusion and Exclusion criteria**

<table>
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<tr>
<td><strong>Language</strong></td>
<td>Published in English</td>
</tr>
<tr>
<td><strong>Availability</strong></td>
<td>available fulltext</td>
</tr>
<tr>
<td><strong>Year of publication</strong></td>
<td>published after 2000</td>
</tr>
<tr>
<td><strong>Population</strong></td>
<td>adolescents aged 13 to 18 years old with VI/Blindness</td>
</tr>
<tr>
<td><strong>Publication</strong></td>
<td>Peer reviewed</td>
</tr>
<tr>
<td><strong>Study design</strong></td>
<td>Qualitative, Quantitative, Mixed studies, Case studies, systematic reviews</td>
</tr>
<tr>
<td><strong>Study focus</strong></td>
<td>Studies where Social interactions and friendships was a main focus</td>
</tr>
<tr>
<td></td>
<td>Studies were social interactions was not a main focus</td>
</tr>
</tbody>
</table>

- Published in English other than English
- Published before 2000
- total population having additional diagnoses along with VI or completely other diagnosis, studies without participants aged 13 to 18 years old with VI
- Theses, books, conference abstracts and papers that not have a clear view about the purpose of the study, books, book reviews, discussion papers
- Studies were social interactions was not a main focus
- Studies where adolescents’ perspective was not included
First the screening for relevance of the preliminary identified articles was implemented on title and abstract level and later on full text level. The deadline for the search of studies was set for March 10th, 2019.

3.5 Selection Process – Step 1: Title and Abstract level

After all the peer reviewed articles published in English that matched the year of publication limits were collected, they were imported into Endnote online library. In this tool for organizing references, duplicates were automatically detected. After the duplicates were removed, screening on title and abstract level took place. At this stage articles were excluded if there was evidence in the title and/or abstract that the study addressed another topic, focused on whole population of individuals with other or additional diagnosis along with VI, participants were not within the age limits and social interaction and/or friendships was not the main focus.

3.6 Selection process –Step 2 Full -text level

After the title and abstract screening the remaining articles were read in full-text and were excluded whenever the full-text was not freely available. In the full-text screening all the inclusion criteria mentioned in Table 2 were taken into consideration. Most of the articles excluded in this step were not including adolescents’ perspectives in their research or they were discussion papers or other types of publications that were part of the exclusion criteria. In this step the reference lists of included articles were hand searched and a few potentially relevant articles were identified. Those hand searched articles were also reviewed at abstract and full-text level till the searching process was completed, as presented in detail in Appendix A.

3.7 Data extraction

The data extracted from the 18 finally chosen studies were charted in to an extraction protocol in the Excel program. The protocol included general information about the study, such as author, year of publication, journal, but also more specific information related to the aim of the study, the design, the participants, the results and the conclusions, see Appendix B, as suggested by Arskey & O’Malley (2005).
3.8 Data Analysis

While the information from the included studies was charted in the extraction protocol, notes were taken and organized. The analysis was complete after the data from all the included studies were charted. First an overview of the articles was created that included general information about them and then, by grouping similar information from different articles together, themes were created in order to answer the research questions.

4. Results

4.1 Overview of results

This search in electronic databases and reference lists identified 1009 articles in total, 18 of which were included for review since they were meeting the inclusion criteria and answered at least one of the research questions. The publications and some descriptive details about them are presented in Appendix C. Out of the 18 included publications the majority (n=9) were studies with quantitative design, six of them were qualitative and three of the publications had mixed design.

The ages of the participants in the included studies was ranging. Although the age of the participants in the included studies varied from 5 to 30 y.o., the focus was made only on adolescents 13-18 y.o (see Appendix C). Only one study was longitudinal and was observing the children-youth from the age of nine till the age of fifteen (de Verdier, 2016). To compare social interactions of adolescents with vision impairments several studies included sighted peers with typical development (Hadidi & Al Khateeb, 2013; Lifshitz, Hen, & Weisse, 2007; Pinquart & Pfeiffer, 2011; Kroksmark & Nordell, 2001; Khadka, Margrain, Woodhouse, & Davies, 2012; Kef, Hox & Habekothe, 2000) or both sighted peers with typical development and sighted adolescents with other disabilities (Huurre & Aro, 2000).

Two studies described interventions implemented to improve the social interactions of adolescents with vision impairments were identified in this scoping literature search (Peavey & Leff, 2002; Young-il, 2003) and the context of the intervention was school.

Finally, three studies included other participants, parents and teachers along with adolescents (Arndt, Lieberman, & James, 2014; de Verdier, 2016; Young-il, 2003).
Since this study was focused on adolescents’ perspective, the other participants’ perspectives will not be presented.

### 4.2 Characteristic of social interactions and friendships of adolescents with visual impairment

All studies investigating the social interactions and friendships of adolescents with vision impairments agreed that this group of youth preferred to engage in more passive activities, such as watching TV and play video games (Gold, Shaw, & Wolffe, 2010; Jessup, Bundy, Broom, & Hancock, 2018) or in other pre-established activities that were usually not highly interactive (Kroksmark & Nordell, 2001). The majority of interactions happened online or through phone at home but still most time was spent home alone (Jessup, Bundy, Hancock, & Broom, 2017). Nevertheless, adolescents reported being satisfied with their friendships and the size of their networks (Arndt, Lieberman, & James, 2014; Jessup, Bundy, Hancock, & Broom, 2018; Kef, Hox, & Habekothe, 2000) both in and out of school and they felt included and accepted (Jessup, Bundy, Broom, & Hancock, 2017). In other contexts, such as sports and music organizations, they reported to feel more accepted than in schools (Jessup, Bundy, Broom, & Hancock, 2018). Moreover, friendships in schools were rare as adolescents with VI felt they had no power in affecting their peers reactions and perceptions on their disability and therefore they became distant easily (Worth, 2013).

#### 4.2.1. Characteristics of their friends

Adolescents with VI created friendships with sighted alongside with non-sighted peers in different contexts (Arndt, Lieberman, & James, 2014) and in schools. In schools however, they tended to create relationships with individuals that were less accepted by typically developing peers (Rosenblum, 2000) and approximately 10% of their social networks consisted of individuals with visual impairments as well (Kef, Hox, & Habekothe, 2000). Adolescents with VI perceived their friendships as age appropriate (Rosenblum, 2000) and valued the level of independence when choosing their friends (Lifshitz, Hen, & Weisse, 2007). Based on within group comparisons, adolescents with low vision had more sighted peers than those with blindness and the blind adolescents spent more time online socializing compared to those with low vision (Gold, Shaw, & Wolffe, 2010). Contradictions existed in the perceived quality of friendships. In some studies adolescents with VI reported having friends who they valued (Rosenblum,
2000) and in others low quality of friendships was reported (Lifshitz, Hen, & Weisse, 2007).

4.2.2. Feeling of loneliness

Regarding the feeling of loneliness and alienation in the study conducted by Kef, Hox, & Habekothe (2000), the majority of adolescents with VI were not very lonely, in contrast to what have been reported by Punia & Berwal (2017), as the students in their study were moderate to highly alienated both in inclusive and mainstream schools with a greater sense of alienation in special schools.

Age seemed to be additionally contributing to this feeling of loneliness, and more specifically the feeling of social alienation, as in a sample of participants aged 5 to 18 years old, individuals older that ten years old, were feeling more alienated (Khadka, Margrain, Woodhouse, & Davies, 2012).

4.2.3 Student voices on the importance of friendships and social interactions

Having a disability can be challenging and according to statements of adolescents with vision impairments in Finland (Huurre & Aro, 2000) having a supportive social network with friends was helpful in order to cope with the impairment. As reported by the adolescents themselves, the contribution and the role of their friends was perceived as even more important than the one of the close family members, classmates and other colleagues (Kef, Hox, & Habekothe, 2000).

In the context of school, friendships were considered a major factor that made school life more enjoyable (Jessup, Bundy, Broom, & Hancock, 2017). Friendships and social life during school years were things valued by adolescents as social inclusion in school was a strong indicator of their future social inclusion in society (Worth, 2013). However, when feeling socially excluded, not accepted by peers at school and when they had not formed quality friendships, adolescents with vision impairments, usually with low vision, tried to hide their disability by not using low vision devices (Khadka, Margrain, Woodhouse, & Davies, 2012), abandoned Braille and refused to use specially adapted materials created to help them academically and consequently they became stressed (de Verdier, 2016).
4.3 Comparisons with sighted peers

Adolescents with VI had smaller social networks and less friends than sighted adolescents (Pinquart & Pfeiffer, 2011; Kef, Hox, & Habekothe, 2000) even compared to sighted peers with chronic conditions (Huurre & Aro, 2000). Therefore they spent less leisure time in activities with friends compared to sighted peers (Huurre & Aro, 2000; Lifshitz, Hen, & Weisse, 2007) and had even less interactions with them through phones (Kroksmark & Nordell, 2001). Even though both groups reported to have many interests in common, adolescents with vision impairments struggled to attend some activities that their sighted peers normally did, because of their inability to drive (Gold, Shaw, & Wolfe, 2010; Kroksmark & Nordell, 2001; Kef, Hox, & Habekothe, 2000), or because of their limited night vision, for the activities that occurred in evening time (Gold, Shaw, & Wolfe, 2010). Generally, adolescents with VI preferred indoor and pre-established activities (Khadka, Margrain, Woodhouse, & Davies, 2012; Kroksmark & Nordell, 2001) and their meetings with friends were mostly goal oriented and not spontaneous like those of their sighted peers (Kroksmark & Nordell, 2001).

Findings about loneliness showed contradictions. The study by Hadi and Al Khateed (2013) reported that the feeling of loneliness for adolescents with vision impairments was higher compared to their sighted peers. On the contrary Kef, Hox, & Habekotheke (2000) proved that there was no significant difference in adolescents with and without vision impairments on the perceived support they got from their peers and the feeling of happiness or loneliness.

4.4 Barriers and facilitators of the social interactions and friendships

The barriers and facilitators of the social interaction identified by the included studies were organized according to the domains of the International Classification of Functioning for Children and Youth (ICF-CY) (WHO, 2007). Functioning and disability factors and environmental factors interfere with social interactions and friendships of adolescents’ with VI. More specifically environmental/contextual factors are related to attitudes and social environments, and functioning and disability factors are related to body functions and structures (WHO, 2007).
4.4.1 Barriers

Functioning and disability barriers: Body functions and structures

Severity of the vision impairment and whether it existed since birth or not seemed to affect the size of networks and the extroversion. Students with low vision were less extroverted than blind students and consequently had smaller friend networks and smaller chances to form friendships with peers because of their introversion (Pinquart & Pfeiffer, 2011). In a study by Gold, Shaw, & Wolfe (2010) on the other hand, there was no difference in the number of close friends between students with low vision and blind students. Huurre and Aro (2000) reported that vision impairments since birth were connected to more problematic relationships with friends and also supported the opinion that as the severity of the vision impairment increased, similarly increased the feeling of loneliness. In this study blind students felt lonelier than the students with low vision, however, a more recent study reported the opposite (Gold, Shaw, & Wolfe, 2010). Adolescents with low vision in this second study reported to face more social challenges compared to their blind peers.

Issues related to Body functions and structures such as limited poor night vision were also reported to interfere with social interactions and friendships as it consequently limited the evening activities that adolescents could take part in and therefore it limited their social interaction opportunities (Gold, Shaw, & Wolfe, 2010). Similarly, the lack of mobility and orientation that makes adolescents depend on others, mostly parents, for their transportations, became an additional barrier since it interfered with their independence in social interactions with peers, (Huurre & Aro, 2000; Gold, Shaw, & Wolfe, 2010).

The presence of additional disability was also reported to be a barrier for adolescents with vision impairments (Jessup, Bundy, Broom, & Hancock, 2017; Jessup, Bundy, Broom, & Hancock, 2018; de Verdier, 2016). Additional disability was related to higher levels of loneliness and less interactions in and out of schools with peers, especially when the disability was followed by behaviors that could be perceived as strange by the blind adolescents’ peers, such as in cases of ADHD, Asperger’s Syndrome or Intellectual disability (de Verdier, 2016).
However, even without additional disabilities, there were several characteristics of adolescents with low vision and blindness such as introversion (Pinquart & Pfeiffer, 2011), problematic social skills and inability in using visual cues (Huurre & Aro, 2000) that did not allow them to take initiative in social interactions or leaded to problematic interactions especially with peers.

**Environmental barriers: Physical, Attitudinal and Social environment**

**Physical environment**

Physical barriers identified were distracting noises created by peers while interacting (Jessup, Bundy, Hancock, & Broom, 2018) and the aspect of time as adolescents with VI needed more time in order to engage in activities with friends but they often did not get that extra time (Gold, Shaw, & Wolffe, 2010).

**Attitudinal environment**

Stereotypes and negative attitudes about blindness (Gold, Shaw, & Wolffe, 2010; Worth, 2013) and reduced tolerance of peers and classmates especially in the senior levels (de Verdier, 2016) classified the adolescents with VI as one of the less preferable group of peers for potential friendships.

Overprotection by teachers or parents and the provision of support beyond what the youth needs, represented another barrier for adolescents since they were restricted from doing several activities or were often accompanied by adults, which negatively impacted the social interactions with their peers (Gold, Shaw, & Wolffe, 2010; Jessup, Bundy, Broom, & Hancock, 2017; Jessup, Bundy, Broom, & Hancock, 2018). Additional environmental barriers were the worries that adolescents with VI had about potential reactions of peers to some of their individual behaviors which could be perceived as weird (Gold, Shaw, & Wolffe, 2010). Similarly, some previous bad experiences of bullying and rejections adolescents with VI had (Rosenblum, 2000; Jessup, Bundy, Hancock, & Broom, 2018) made them defensive and resistive in developing relationships and friendships in an attempt to avoid being rejected or teased again.

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**Social environment**

Environmental factors were crucial for the successful social interactions of adolescents with VI. Matters depending on the context, especially whether the interaction occurred in or out of school, the type of school the adolescents were attending, whether it was a special or inclusive school, were reported to have a major impact. Nevertheless, contradictions existed in the results found in the different studies on this topic as presented below.

Punia & Berwal (2017) reported that special schools and exclusive settings were associated with increased loneliness and alienation of adolescents with vision impairments. The study by Jessup and colleagues reported that students in mainstream schools felt not accepted, lonely and not fitting in (Jessup, Bundy, Broom, & Hancock, 2017; Jessup, Bundy, Broom, & Hancock, 2018; Jessup, Bundy, Hancock, & Broom, 2018). This was in situations when they had nothing to do, while their peers were busy doing an activity that was not moderated to enable their participation. Similar results appeared in another study (de Verdier, 2016) as there were reports that students felt accepted and socially included after they moved to special schools. However, according to Worth (2013), the same challenges existed both in mainstream and in special schools when the schools adopted the medical rather than the social model of disability and consequently focused only on body impairments.

**4.4.2 Facilitators**

*Functioning and disability barriers: Body functions and structures*

An individual characteristic of adolescents with vision impairments that could facilitate their social interactions and friendships was if they were extroverts (Pinquart & Pfeiffer, 2011). Examples of extrovert personal characteristics were: taking initiatives to go out there and communicate with people (Jessup, Bundy, Hancock, & Broom, 2018), having social skills to develop friendships e.g. using the right tone of voice, along with some practical skills, such as dancing and being independent (Arndt, Lieberman, & James, 2014). Skills to handle potential rejection were also facilitating social networking (Jessup, Bundy, Hancock, & Broom, 2018). Strategies to develop friendships was also a useful skill for adolescents with vision impairments (Jessup, Bundy, Hancock, & Broom, 2018). One specific example was to be able to recognize common interests with
peers to base their relationships on, and also make sure there is reciprocity in the relationship so that both parts give help and get helped (Rosenblum, 2000). Another thing that could attract peers and ignite their interest to create friendships with individuals with vision impairments was the presentation of unique competencies such as Braille reading (de Verdier, 2016). Even though this technique, as de Verdier (2016) states, had no long-term effectiveness, other researchers also agreed that it was important for young people with vision impairments to have chances to show their specific talents and abilities in schools (Jessup, Bundy, Hancock, & Broom, 2018).

Moreover, factors such as gender, age and severity of impairment were reported to facilitate social interactions in some studies. Males reported to be less lonely (Jessup, Bundy, Broom, & Hancock, 2018) but in other studies girls succeeded more in getting support from peers (Pinquart & Pfeiffer, 2011), had more listed friends and were more satisfied with their friendships (Kef, Hox, & Habekothe, 2000). Furthermore, adolescents with better vision reported to be less lonely (Jessup, Bundy, Broom, & Hancock, 2018) and younger adolescents were more satisfied with the social support networks, one of which is friends (Kef, Hox, & Habekothe, 2000).

Environmental: Physical, Attitudinal and Social environment

Physical environment

Having access to equipment in order to take part in sport activities with peers or using technologies in order to communicate through texting were relevant for youth with visual impairments in order to create and maintain relationships with their peers (Arndt, Lieberman, & James, 2014).

The variable of time was mentioned in several reports as a factor that was crucial in order to form social relationships and friendships (Jessup, Bundy, Broom, & Hancock, 2017; Jessup, Bundy, Hancock, & Broom, 2018; Rosenblum, 2000; de Verdier, 2016). Undoubtedly spending time with a person was important for friendships to develop (Rosenblum, 2000) but one study also mentioned the importance of becoming a member of a peer group early, a the earlier a young person with VI became a member of a peer group, the more secure and positive role they had in that group (de Verdier, 2016).
Lastly, another physical factor that facilitated peer relationships and networks for adolescents with VI, was when the adolescents were living away from parents, either in an institution or independently (Kef, Hox, & Habekothe, 2000).

**Attitudinal environment**

Peers’ behaviour that reinforced social interaction with their blind peers, comprised of small talks, making attempts to get to know them and making sure they feel listened to and noticed in group chats (Jessup, Bundy, Hancock, & Broom, 2018). Such actions provided them with a sense of belonging (de Verdier, 2016). Another facilitator for adolescents with VI to feel socially included was when students from other classes interacted with them and when interactions occurred in groups of friends doing activities together (Jessup, Bundy, Broom, & Hancock, 2017). Empathy from peers as a result of their previous experiences with visually impaired people or other people with disabilities was a major factor for friendships (Rosenblum, 2000).

Teachers’ behaviors towards adolescents with VI was also important as it could positively affect their classmates’ behaviors (de Verdeir, 2016) especially when they were making adolescents with VI feel noticed and included (Jessup, Bundy, Hancock, & Broom, 2018). On the other hand, it was also important that classmates did not feel disadvantaged compared to their visually impaired peers (de Verdeir, 2016) because this could probably create tension and prevent friendships between them. Lastly providing youth with vision impairments with independence and give them time with their sighted peers alone was an important facilitator for friendships not only in schools but in other settings as well (Arndt, Lieberman, & James, 2014).

**Social environment**

The setting could contribute to the formation of relationships, as the context of classroom, in comparison to the recess, made it easier for students with vision impairments to become included and interact with peers (de Verdier, 2016). The type of school, inclusive or special school, as mentioned before affected social inclusion, however there were contradicting opinions about which type of school facilitates and which type hinders the inclusion and the social interactions of adolescents with VI (Punia & Berwal, 2017; de Verdier, 2016; Worth, 2013).
4.5 Interventions and their effectiveness

Only two studies included in the present scoping review focused on interventions intervention programs implemented in order to support the social interactions of adolescents with visual impairments.

The first intervention, by Peavey & Leff (2002), used diversity ideas exposure, trust-creating activities and team-building exercises in order to improve the social acceptance of 30 pre-adolescents and adolescent sighted students (n= 25) and their peers with low vision and blindness (n=5) aged 10-15 years old. This study was conducted in an inclusive school in the United States. Other main goals for this intervention was for students to take part in and establish friendships with each other to showcase acceptance and understanding of differences between them. The intervention took place in the same school and needed several group meetings of the 30 students and the instructor to complete. After the intervention, the students with VI showed higher post test scores in the Social skills’ assessment and all students reported improvement in their social acceptance. The overall outcome of this intervention was for students with VI to “fight” their social isolation by establishing relationships with peers.

The second intervention found was implemented in the same country by Young-il (2003) in a group of 23 students with low vision (n=15) and blindness (n=10) ages from 13 to 19 years old. One of the main goals for this intervention was to help students with VI to acquire/improve their social skills. The intervention took place in a special school for blind students in southwestern United States and lasted 12 weeks. Each week the participants from the two treatment groups (n=11) had a group meeting where cognitive-behavioral strategies where used in order to improve their social skills and overcome their potential performance difficulties following an assertiveness training curriculum. For the evaluation of this intervention, a control group with twelve students was used but no significant effects were reported in the post-tests about the adolescents’ social skills. Social skills seemed to improve in both groups. Neither was significant difference reported in the reduction of students’ behaviors that could potentially influence their interpersonal relationships negatively. A nearly significant improvement was showcased in the assertiveness score of the treatment group in comparison to the control group, although it was already higher in the pre-tests.
5. Discussion

Studies with different designs were implemented in order to investigate and examine the social lives of adolescents with vision impairments. Having both quantitative and qualitative approaches available in this study but also in general is important in order to understand the life situation of adolescents with vision impairments (Chak & Rahi, 2007). The results of this scoping review showcased that adolescents with vision impairments engaged more in passive activities that were not highly interactive. They reported being satisfied with their networks and friends, even though they were relatively smaller than the ones of their sighted peers, and they had different type of relationships with their friends. Contradictions existed in the perceived quality of friendships and the feeling of loneliness. The context of school was presented often as problematic as adolescents with vision impairments felt less included there, compared to other contexts, and friendships in schools were rare. According to adolescents’ voices, friendships helped to cope with the impairment, friends had a meaningful role in their life and made school life more enjoyable. Lastly even though several barriers and facilitators were identified, there was a lack of interventions aiming to support the social interactions and friendships of adolescents with VI.

5.1 Principal findings and relationship to earlier publications

The findings of this present scoping review, concerning the fact that adolescents with VI spent more time home alone with passive activities that were not highly interactive, and had smaller networks than their sighted peers, support findings from previous studies (Wolff & Sacks, 1997). Differentiations in the time spent with peers and the quality of these experiences of companionship existed in this scoping review. Evidence supports that these differentiations depend upon adolescents’ personal characteristics such as introversion, depression and giftedness (Hektner, Schmidt, & Csikszentmihalyi, 2007).

The perceived barriers and facilitators within the ICF-CY, belong to Body functions and structures and Physical, Attitudinal and Social environment. These barriers and facilitators and several challenges that arise need to be taken into consideration when planning future research and interventions since the interventions provided so far are limited. Nevertheless, there are several things that are worth more reflection and discussion:
1. Personal factors such as age, gender and severity of impairment seemed to be correlated to different aspects of interactions and friendships. However, since these are personal characteristics of the individuals that cannot change, they cannot be the main targets of interventions. Potentially, age, gender and severity of impairment could be taken into consideration when intervening as they were reported to work both as barriers or facilitators depending on the situation and the context.

2. Regarding the context, which is considered environmental factor, several interesting reports were highlighted in this scoping review. According to studies where social interaction was examined in different contexts, the main conclusion was that the school setting is presented as problematic. Adolescents with VI feel less included in schools compared to other contexts and friendships in schools are rare. Both in mainstream and special schools, adolescent students with vision impairments had the fewest friends and felt more alienated. This situation was reported for typically developing adolescents as well as in a study by Van Roekel and his colleagues (2015) where the context of school was the one where the adolescents felt most lonely even in the presence of classmates. The fact that the school was described in most cases as a barrier for inclusion and it is problematic for the creation of friendships, is a worrying result considering the amount of time the students spend in that setting, specifically for students with VI who tend to not spend the same amount of time in other settings as as compared to their sighted peers, based on the results of this review.

3. Facilitators consisted mostly of the developed social skills of the adolescents with VI themselves and also the initiative of their peers to give them time, attention and respect. In most cases though it was reported that the social skills of adolescents with VI were not as developed as they should. Teachers seem to identify barriers related to lack of social skills of students with VI and lack of understanding of sighted peers but they do not consider their behavior as a major factor. Teachers, as role models, crucially affect peers’ behaviors/ attitudes, however, it is also important to give to adolescents with VI the amount of independence and time they need in order to freely interact with peers. Many concerns arise though, as teachers are not sure about when and how to intervene in order to support the social interactions of students with VI (de Verdier, 2016).
4. Facilitators such as having access to equipment were also reported especially for participation in physical activities (Arndt, Lieberman, & James, 2014), but no other suggestions on how to improve the setting in order to support the social inclusion of adolescents with VI were reported.

5.2 Social interaction in a perspective of the F-words

Applying the F-words, especially the words *family, fun* and *friends* (Rosenbaum & Gorter, 2012) to social interactions, according to the results from the studies included in this scoping review, there are several things that need to be discussed.

In order for social interactions to occur and for friendships to be created the need for given independence from parents was a high demand for adolescents in this study. This is a situation where the f-word of *Family* appears to significantly affect the domain of socialization. Interesting is the fact that parents in the included studies reported to be aware of that need of adolescents and seem to realize that their overprotection can be restricting. Therefore, the need to find ways to consult and support them to cope with their overprotective parental feelings arises since there are evidence that their overprotection is associated with variables relevant to adolescents’ peers and friendships (Pinquart & Pfeiffer, 2011).

For the aspect of *Fun*, it is reported that even though adolescents with VI are having similar interests and needs as their sighted peers (for a quality social network and friends with whom they would spend their leisure time), in practice they tend to have smaller social networks and they spend even less time with friends. Concerns arise since adolescents mention that they do mostly goal oriented activities with their friends (e.g. a school project), when their peers do not need this type of goals to initiate activities. The environmental, physical and attitudinal barriers could be a possible explanation for this, especially parental restrictions and the inability to transport independently especially when it is dark outside. However, there are reports that cannot be justified by those environmental and body function barriers, specifically those that highlight a limited communication with friends through phone calls or through internet (Jessup, Bundy, Hancock, & Broom, 2017). Even compared to adolescents with disabilities other than VI it was found that pre-adolescents and adolescents with visual impairments used computers and received telephone calls significantly less often than did students in other disability groups (Kelly & Smith, 2008). They also received significantly fewer
phone calls from friends than did students with other disability groups (Kelly & Smith, 2008). Kelly & Smith (2008) suggest that as adolescents with VI mature, they may become more socially isolated, compared to their counterparts with other types of disabilities, even in the digital world and arguing for potential benefits of training on and use of assisting technology.

For the f-word *Friends* previous studies reported that students with special education needs and disabilities have difficulties to form friendships especially with students without special educational needs (Koutsouris, 2014). This statement concerns adolescents with VI as well, considering the results of this study. Even though there are reports suggesting that adolescents with VI form friendships with sighted peers, it is mentioned that in mainstream schools they mostly form relationships with other students perceived as “outsiders” whom sighted peers do not choose for companionship. In line with the sociological term homophily, which describes the attraction to similar others (Koutsouris, 2014), this tendency expresses that adolescents with VI perceive themselves as “outsiders” and unequal to their typically developing sighted peers. This may indicate that they do not feel socially included in school.

Since the quality of friendships and networks is what matters and not the quantity (Rosenbaum & Gorter, 2012), more worries arise for the quality of friendships of youth with VI as well. There are reports where students with low vision, tried to hide their disability from their friends and peers by not using low vision devices abandon Braille and refuse to use specially adapted materials created to help them to succeed academically (Khadka, Margrain, Woodhouse, & Davies, 2012). Previous research suggests that teenagers with mild vision impairments performed lower scores compared to their peers in psychosocial and school related evaluations (Wong, Machin, Tan, Wong, & Saw, 2009). They also received lower grades, perceived their homework as difficult and needed more assistance from family and experts (Wolffe & Sacks, 1997). Therefore, this situation of students refusing the support is worrying and needs to be further investigated. Undoubtedly, students with VI need to use helping devices and rejecting them may cause stress and additional risks for their success, academically and in other domains (de Verdier, 2016; Khadka, Margrain, Woodhouse, & Davies, 2012).
5.3 Limitations

Several issues occur in scoping reviews (Arksey & O’Malley, 2005), some of which will be presented below.

Scoping reviews are narrative and descriptive in nature. These studies aim to gather a considerable amount of evidence and do not formally assess quality. Even if scoping reviews can include studies with different study designs, which is not usual for systematic reviews, a limitation occurs because of the absence of a synthesis of findings which is important for evidence based research.

Specifically, since only studies published in English were included for practical reasons, there is a possibility that relevant papers could have been excluded if they were published in other language. Only 3 databases were chosen, ERIC, CINAHL and PsycINFO. The reason was that they were the databases that provided the most relevant results for the aim of this study. However, there is a plethora of other existing databases and there is a possibility that other unique and relevant articles exist.

For this scoping review, only one researcher was responsible for the selection and presentation of the studies included and the generation of themes. This is a limitation since the inclusion of bias is unavoidable. The writing procedure was based on one reviewer’s interpretations and critical reflections. For this reason, other aspects related to social interactions such as bullying and dating, where not discussed even though these topics are closely related to social inclusion.

Some of the findings in this scoping review are contradictory, even between studies that had similar aims and similar research methods and this could be perceived as a limitation as there is no clear answer why these contradictions exist. This fact is not helpful in order to make generalizations about the results, neither when presenting the life situation, specifically the social interactions, of adolescents with vision impairments.

Lastly this scoping review even though it was focused on adolescents aged 13 to 18 years old, it included articles whose total population could include younger or older individuals as well. Since there were no mentioned age differentiations, even within studies whose sample ranged from 5 till 18 year old, limitations occurs as those age differentiations could possibly affect the results.
5.4 Ethical issues and considerations

In order for ethical standards to be maintained in research, there are several ethical considerations that cannot be omitted. Obtaining ethical approval from ethics boards, inform, consent from participants and maintaining confidentiality, are some of the methods ensuring ethical standards (Creswell, 2009). Additionally, in cases of adolescents their own assent and permission should be supplemented by the permission of parents or guardians (Levine, 2008).

In the included studies of this scoping review only nine of them mentioned obtained consent from ethical boards, ten mentioned informed consent from adolescents and nine of them did not mention parental or guardian consent. Thus, ethical concerns arise as those cases did not belong to the exceptional cases where parental consent can be omitted in order to protect the minor (e.g. cases of abuse) (Levine, 2008).

5.5 Practical implications and future directions

Many medical interventions are designed to reduce the negative impact of vision impairment in everyday life and measures are invented to evaluate the health related quality of life (Boulton, Haines, Smyth, & Fielder, 2006). This scoping review, however, highlighted gaps in research regarding social interactions and friendships of adolescents with VI. This calls for further quality studies on the field that highlight differentiations between age and severity of impairment and also better designed interventions with specified targets and proper evaluations.

Even though barriers and facilitators of social interactions and friendships of adolescents with VI are reported in the included studies along with potential targets for interventions, some challenges arise. Existing evidence supports that the older the child is the harder it is for parents and professionals to support and affect positively their social interactions and relationships (de Verdier, 2016). Specifically, for the school context, in the words of youth, “any attempt to force inclusion is kind of disrespecting you” (Koutsouris, 2014, p.532).

Digital interactions open up opportunities in parallel to physical interactions in order to improve the social skills and the social support of adolescents with VI (Gold, Shaw, & Wolfffe, 2010). Both physical and digital interactions are necessary for social success (Kelly & Smith, 2008). This approach may seem promising as there is evidence that
adolescents with VI use phones and internet for social interactions significantly more often than adolescents with other primary disabilities (Kelly & Smith, 2008). However, they still do not use it regularly or in some cases they are not using it at all despite the assistive technology that is provided (Kelly & Smith, 2008). New concerns and needs arise in order to facilitate their technological skills while using those devices and forums and support their social skills in face-to-face interactions as well (Kelly & Smith, 2008).

One more challenge that needs to be addressed is regarding the practical aspect of using assistive devices and support services for adolescents with VI. Recent reports (Datta & Palmer, 2015) mention that students with VI do not use support services in presence of their peers because of embarrassment, and would prefer those services to be provided in more private settings and not in school. However, since the support they need is mostly provided in non-private contexts such as school and community, questions arise on the possibilities of achieving privacy as a solution to this problem.

Special curriculums also need to be designed and implemented in all types of schools with activities and lessons regulating the acquisition of social competence and promotion of self-confidence (Wagner, 2004). This is crucial for students with VI considering the reports that mention that they believe they cannot affect peers acceptance and perceptions on their disability so therefore they become distant easily.

These suggestions for a special curriculums aiming to develop skills for face-to-face and digital interactions and promote self-confidence are inspiring and undoubtedly targeted teacher education is required alongside. However, even if social networks in schools are important for future social interactions (Worth, 2013), time and flexibility in order to implement the suggestions above are not always an actuality especially in the mainstream schools. Further research on this topic needs to be made, and programs that take into considerations the adolescents own voices and needs, have to be implemented.

6. Conclusion

The international community has made huge steps in providing services and promoting the rights of people with disabilities, however there are still barriers that affect their equal participation in society (CEPAL & UNICEF, 2013) and there is inadequate knowledge on the impact that these services have specifically in youth’s lives and
independence (Datta & Palmer, 2015). The focus of this scoping review was to investigate adolescents’ perspectives and perceptions of their social interactions and friendships and the interventions aimed to support them in that domain.

The findings of this scoping review, investigating the social interactions and friendships of adolescents with VI, support the views that this group face increased risk of social isolation, due to their impairment (UNICEF Innocenti, 2007). A range of barriers need to be eliminated in order to gain access to interactions for adolescents with VI. There are not only barriers linked to body functions and structures (UNICEF Innocenti, 2007), but also barriers such as access, communication, opportunities and attitudes that can prevent young people with VI from socializing and creating friendships. Adolescents need to be engaged in this process so that their interests, preferences and their views are prioritized (Rosenbaum & Gorter, 2012). Even though previous literature reports that there are a lot of services offered to support the academic-, everyday- and social life of students with vision impairments (Datta & Palmer, 2015), only two interventions were identified in this scoping review that aimed to support their social interactions and skills. Social inclusion emphasizes social and emotional aspects, as distinct from academic aspects, especially in the school setting (Roe, 2008). Considering the importance of social interactions and friendships in adolescents’ life for them to learn, develop and enjoy, more interventions with social focus need to be designed in respect to the challenges that exist.

“...as social animals we are attracted to other humans more than to most other stimuli in the environment. In their company we tend to feel more alive than when we are alone.”

(Hektner, Schmidt, & Csikszentmihalyi, 2007, p.280)
7. Reference List


8. Appendices

8.1 Appendix A. Flow Chart of the searching procedure

- **ERIC**: n=472
- **PsychINFO**: n=303
- **CINAHL**: n=221

\[ \text{n=996} \]

- Published after 2000: n=582
- Peer reviewed: n=509
- Published in English: n=491

\[ \text{After deleting duplicates: n=399} \]

- After Title and abstract screening: n=21

\[ \text{Excluded: n=378} \]
- Not within the age range limits
- Not about vision impairments
- Social interaction was not the main focus
- Book or Journal reviews
- Discussion papers
- Whole population with different diagnosis or additional diagnosis in parallel
- No full-text available

- After Full-text screening: n=11

\[ \text{Final articles for review: n=11+7=18} \]

- Full-text Excluded: n=14
  - Not child perspectives (n=5)
  - Not within age limit (n=6)
  - Different focus (n=1)
  - Discussion paper (n=2)
8.2 Appendix B. Data extraction protocol

Identification of paper

1. Author
2. Title
3. Journal
4. Publication year

Aim:

Research Question:

Hypothesis:

a. Yes
b. No

If yes, transcribe:

Focus level/target group:

a. youth with disabilities only
b. youth with and without disabilities

Participants - recruited where

a. Home
b. school
c. Other

Country:

Participants - recruited how

a. Written information
b. School
c. Other

Samplings strategy

a. Random
b. Convenience
c. Total population
d. Strategic
e. Combination

**Participants**

Number:

Gender

a. Male
b. Female

Age:

Specific diagnosis/ problem:

**Other Participant adult**

a. Parent
b. Professional:
c. Other:

**Basic design**

a. Qualitative
b. Quantitative
c. Mixed

Longitudinal:
Cross sectional:

**If qualitative design**

1. Type of design

a. Content analysis
b. Phenomenological
c. Grounded theory
d. Narrative
e. Other

2. Type of aim
a. Descriptive
b. Mechanism testing

**If quantitative design**

a. Descriptive
b. Comparative

**Data collection method**

a. Test
b. Questionnaire/structured interview
c. Observation
d. Semi structured interview
e. Document analysis
f. More than one method

**Data analysis quantitative**

a. descriptive
b. correlations
c. regression
d. other

**Theory**

a. Explicit theory about the phenomena:
b. General theory:
c. Both:

**Intervention study**

a. Yes
b. No

If yes, focus is:

a. Adolescents
b. Professionals

**Type of Intervention**

Specific goal:

Where was implemented:
How frequent:
Who was involved:

Focus:
  a. Group
  b. individual

Aspects related to social interaction- Adolescent’s perspective

Characteristics of peers:

Preferences:

Number of friends (satisfied):

Importance of interaction:

Context:

Other information:

Comparisons to sighted peers:

Results /Outcomes- Adolescent’s perspective
  a. Barriers:
  b. Facilitators:
  c. Other:

Clinical/ practical implications- adolescent’s suggestions:

Author’s suggestions:

Conclusions:

..............................................................................................................
## 8.3 Appendix C. List of included articles

<table>
<thead>
<tr>
<th>ID</th>
<th>Author(s)</th>
<th>Country</th>
<th>Participants</th>
<th>Age</th>
<th>Degree of VI (n**)</th>
<th>Purpose of study</th>
<th>Authors' conclusions relevant to social inclusion and friendships</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Arndt, Lieberman, &amp; James (2014)</td>
<td>USA</td>
<td>n=7</td>
<td>12-16 y.o.</td>
<td>Blind</td>
<td>To explore what 7 blind adolescents and their parents say about the adolescents’ social lives and how teachers can ensure positive social relationships for students who are blind</td>
<td>There are physical barriers related to social interactions of adolescents with VI and also barriers related to parental overprotection. Teachers need to address these issues, eliminate the barriers and help adolescents with VI to develop their social skills and develop understanding to their sighted peers.</td>
</tr>
<tr>
<td>2</td>
<td>Rosenblum (2000)</td>
<td>USA</td>
<td>n=20 m=10, f=10</td>
<td>12-18 y.o.</td>
<td>Blind &amp; Low Vi (n=10)</td>
<td>To investigate how 10 adolescents with VI and their best friends perceive the impact of visual impairments on their lives</td>
<td>Perceptions of how their VI affected their lives varied. Several of the adolescents felt excluded from their families, were often outsiders in the hierarchy of the school culture and did not view themselves as being part of the popular group. A key to the success of friendships is having a joint activity in which both members of the dyad can participate.</td>
</tr>
<tr>
<td>3</td>
<td>Kroksmark &amp; Nordell (2001)</td>
<td>Sweden</td>
<td>n=6 m=3, f=3</td>
<td>15-16 y.o.</td>
<td>Low Vi (n=4)</td>
<td>To explore how 4 adolescents with VI and 2 sighted</td>
<td>Adolescents with VI perform fewer activities than their sighted counterparts and engage primarily in</td>
</tr>
</tbody>
</table>
adolescents spend their leisure time and whether their everyday activities are bounded to places or people passive established activities when sighted peers change activities more often and spontaneously and pursue them for shorter period. Adolescents with VI do not regularly spend time with friends when sighted peers speak with friends on telephone or spend considerable time with them. Adolescent with VI are also dependent on parents for transportation and generally have less opportunities to develop competence in everyday activities and become independent of their parents.

| 4 | de Verdier (2016) | Sweden | n=7 
m=3, f=4 | 9 till 15 y.o. | Blind & Severe VI | To describe from a longitudinal perspective aspects of psychological well-being and social inclusion in school for students with VI | Students with VI are a heterogeneous group with different needs and that many of them face social challenges in school and social inclusion does not happen just by placing students with VI in a class with sighted peers. Parents’ and teachers’ possibilities to create organized social arenas for the children to interact diminished drastically as they grew older. |
<table>
<thead>
<tr>
<th></th>
<th>Study Details</th>
<th>Country</th>
<th>Sample Size</th>
<th>Sample Characteristics</th>
<th>Research Question</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Khadka, Ryan, Margrain, Woodhouse, &amp; Davies (2012)</td>
<td>U.K.</td>
<td>n=81, m=46, f=35</td>
<td>5-18 y.o.</td>
<td>VI (n=34)</td>
<td>To identify the educational, social and leisure activities and issues that matter to school children and young people with VI and to compare their lifestyle with fully sighted counterparts.</td>
</tr>
<tr>
<td>6</td>
<td>Worth (2013)</td>
<td>U.K.</td>
<td>n=28</td>
<td>16-25 y.o.</td>
<td>Partially sighted</td>
<td>To examine young people’s with VI possibilities for sociality in mainstream and specialist high schools focusing on narratives of bullying, friendship and their complex relationships with care givers and support workers.</td>
</tr>
<tr>
<td>#</td>
<td>Study Description</td>
<td>Country</td>
<td>Sample Size</td>
<td>Gender</td>
<td>Age Range</td>
<td>Group</td>
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<tr>
<td>7</td>
<td>Gold, Shaw, &amp; Wolffe (2010)</td>
<td>Canada</td>
<td>n=326</td>
<td>m=189, f=138</td>
<td>15-30 y.o.</td>
<td>Blind &amp; Low Vi</td>
</tr>
<tr>
<td>8</td>
<td>Hadidi &amp; Al Khateeb (2013)</td>
<td>Jordan</td>
<td>n=169</td>
<td>m=74, f=95</td>
<td>15-22 y.o.</td>
<td>Blind (n=90)</td>
</tr>
<tr>
<td>9</td>
<td>Huurre &amp; Aro (2000)</td>
<td>Finland</td>
<td>n=766</td>
<td>m=370, f=396</td>
<td>12-17 y.o.</td>
<td>VI (n=115)</td>
</tr>
<tr>
<td>Study</td>
<td>Country</td>
<td>Sample Size</td>
<td>Sample Age</td>
<td>Groups</td>
<td>Methodology</td>
<td>Findings</td>
</tr>
<tr>
<td>-------</td>
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<tr>
<td>10</td>
<td>Lifshitz, Hen, &amp; Weisse (2007)</td>
<td>Israel</td>
<td>n=81</td>
<td>13-21 y.o.</td>
<td>Blind &amp; Low Vi (n=40)</td>
<td>To compare the self-concept and the quality of friendships of adolescents with VI and their sighted peers. Low quality of friendships was reported for adolescents with VI with no similar personal social networks to their sighted peers. Sighted peers spend more leisure time with friends but also report higher levels of confrontation and betrayal among them. Adolescents with VI seek for independence in their friends and do not consider the severity of potential impairment.</td>
</tr>
<tr>
<td>11</td>
<td>Pinquart &amp; Pfeiffer (2011)</td>
<td>Germany</td>
<td>n=316</td>
<td>12-19 y.o.</td>
<td>To analyze the role of parental overprotection and extroversion in forming relationships with peers among sighted adolescents and ones with VI. Adolescents with VI were less successful to belonging in a peer group and gain many friends than their sighted peers and were less extroverted. Both groups did not differ in the perceived parental overprotection but extroversion and parental overprotection were associated with peer and friendship variables.</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Punia &amp; Berwal (2017)</td>
<td>India</td>
<td>n=200</td>
<td>10-25 y.o.</td>
<td>Blind &amp; Low Vi</td>
<td>To study the feeling of alienation among students with VI in inclusive and special school settings and compare their feeling of alienation in those two settings. Students with VI were more alienated in special schools. The barriers for social interaction and inclusion in this study is the exclusive setting of special schools.</td>
</tr>
<tr>
<td>No.</td>
<td>Authors (Year)</td>
<td>Country</td>
<td>Sample Size</td>
<td>Age</td>
<td>Condition</td>
<td>Intervention</td>
</tr>
<tr>
<td>-----</td>
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</tr>
<tr>
<td>13</td>
<td>Peavey &amp; Leff (2002)</td>
<td>U.S.A</td>
<td>n=30</td>
<td>10-15 y.o.</td>
<td>Blind &amp; Low VI (n=5)</td>
<td>To discover whether an intervention based on exposure to ideas about diversity, team-building activities and trust-creating exercises can improve social acceptance, establish friendships and develop greater understanding and appreciation of the differences between adolescents.</td>
</tr>
<tr>
<td>14</td>
<td>Kef, Hox, &amp; Habekothe (2000)</td>
<td>Netherlands</td>
<td>n=316</td>
<td>14-24 y.o.</td>
<td>Blind &amp; moderate/severe VI</td>
<td>To examine the social networks of adolescents with VI in comparison to sighted peers and investigate what factors affect the wellbeing of adolescents with VI.</td>
</tr>
</tbody>
</table>
adolescents with VI experience a high level of happiness and they are not feeling very lonely. A few effects of sex, age, SES, living situation, degree of impairment and dependency in mobility on the network aspects were found. Of the individual characteristics, only the degree of independence in mobility influences well-being.

| 15 | Young-il (2003) | U.S.A | n=26 m=14, f=12 | Blind & Low Vi | To investigate the effects of an intervention based on assertiveness training to enhance the social and assertive skills of adolescents with VI | Adolescents' social skills were judged differently by parents, the students themselves, teachers, and observers. The training had some specific effect on increasing the participants' assertiveness however the training was not found to have any significant effect on improving social/assertiveness skills nor decreasing cognitive distortions, as rated by the students themselves. Parents reported higher social skills in the control group on post-test than teachers and students themselves |

| 16 | Jessup, Bundy, Broom, & Hancock (2017) | To explore the social experiences in high school of students with VI | Students fitted in and felt most accepted doing activities with a group of friends but friendships require time, common interests, and reciprocity. |

Mixed Studies
<table>
<thead>
<tr>
<th>ID</th>
<th>Authors</th>
<th>Country</th>
<th>Sample Size</th>
<th>Age</th>
<th>Disability</th>
<th>Summary</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>Jessup, Bundy, Broom, &amp; Hancock (2018)</td>
<td>Australia</td>
<td>n=12, m=6, f=6</td>
<td>13-17 y.o.</td>
<td>Blind &amp; Low VI</td>
<td>To compare the experiences of high school students with VI in and out of school</td>
<td>No significant correlations with, age, grade, level of vision were reported. Gender did not seem to have any effect either. Adolescents with VI spent large amounts of time in socially passive activities, alone or with family despite the virtual communication technologies. In school they receive more help than they give which creates tension. Doing nothing at school is a barrier to social inclusion and further research is needed on how to support them socially.</td>
</tr>
<tr>
<td>18</td>
<td>Jessup, Bundy, Hancock, &amp; Broom (2018)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>To explore how students with VI described school social inclusion, whether they felt included and what influenced these perceptions</td>
<td>Many participants had satisfactory relationships in high school, yet one-third struggled. All the participants with VI and additional disabilities had social challenges. School environment needs to support their social skills and self-determination in particular.</td>
</tr>
</tbody>
</table>

*ID: Identification number for the article

**n: the number of adolescents with VI if in the study participated also sighted peers.