A qualitative study on the knowledge and attitude of primary school students towards pediculosis capitis

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Abstract

Background

Pediculosis capitis -or infestation with head lice-is frequent in school-aged children. While the clinical consequences are limited to itchiness and irritation, the social impact of infestation remain high, often due to a lack of knowledge and prejudice. Most research focusses on treatment and prevalence, but rarely on evaluating knowledge, perceptions, and beliefs.

Methods

We used a qualitative methodology (semi-structured interviews) to assess the knowledge and attitude of the students. Ten primary schools in Flanders were included and the opinions of 240 students from fourth, fifth or sixth grade were obtained. The knowledge was tested with ten true/false questions and their perception with an in-depth interview. Data-analysis was performed using the QUAGOL method (Qualitative Analysis Guide of Leuven).

Results

The knowledge test revealed a mean score of 63% (SD ±37%). The topics 'lifecycle', 'symptoms' and 'transmission' scored the worst. The most prominent misunderstanding is the belief that head lice can jump (21% correct). In the reflective part, three main themes occur: misconceptions, attitude (feelings, friendship, behaviour) and disclosure (towards parents, teachers and friends).

Conclusion

This study examined the knowledge and perceptions of primary school students in Flanders concerning head lice. Students failed to assess the transmission route adequately. The main concepts in their reasoning were identified. Accurate health education could be used to counter misconceptions and social stigma

Introduction

Pediculosis capitis, head lice, remains an important and prevalent infestation that affects 8.9 percent of school-aged children, particularly between the ages of three and eleven years old (1,2). It is mainly a paediatric health issue, even though adolescents and adults can also become infected by direct head-to-head contact. Girls tend to be infected more often because of two reasons. Firstly, because of gender-related behavioural differences (girls usually maintain closer contact in groups) and secondly, because of their greater hair length (3). An infestation with head lice can be very unpleasant; but fortunately, the morbidity is mainly limited to itchiness and irritation, while scratching can lead to skin lesions (4).

In contrast to the limited morbidity, a major taboo still exists when someone is infested with head lice. It is often associated with a lack of hygiene, which leads to stigmatisation of the affected children or the so called 'index families' (5). However, research has not found head lice infestation to be significantly reduced by frequent hair washing (1). The negative social consequences (due to a lack of knowledge and prejudice) induces parents not to report when their children are infected. Children on the other hand fear their parent's reaction as they often respond to the news with disgust (6). However, when this information is not disclosed, an outbreak of head lice can spread rapidly.

The majority of research on pediculosis capitis addresses topics like treatment and prevalence while fewer studies have been performed to evaluate knowledge, perceptions, and beliefs. Sidoti et al. showed that there were deficiencies in the knowledge of schoolteachers and students, for instance on the biology of head lice and prevention (7). A study from Thailand demonstrated that adequate health education packages are an effective tool to reduce head lice infestations in schoolgirls (8). This type of research is essential to provide quantitative information on the subject-matter, but an in depth analysis using a qualitative methodology is still lacking. A closer look on perceptions, attitude, and beliefs about head lice in primary school students would be very meaningful as a better understanding of misconceptions, can be used to better educate and mitigate taboo or stigmatisation. This could in turn lead to fewer infections and a better well-being of children in primary schools.

The research question of this study is: 'What is the knowledge and attitude of primary school children in Flanders on pediculosis capitis?'. We hypothesize that there are still many misunderstandings, that children lack a thorough knowledge and that negative emotions (e.g., fear, disgust, shame) are widely present. To investigate this topic we conducted qualitative research using semi-structured interviews with primary school children.

Methodology

Study design

We used a qualitative study design with semi-structured interviews. The strength in this type of research lies in a thorough exploration of thoughts and feelings of participants regarding a specific topic, including personal and even sensitive issues (9). In preparation of the study, an interview guide was designed to guide the discussion and ensure a consistent theme analysis.

In the study the vocabulary and content was adjusted to the level of comprehension and knowledge of primary school children. One school was part of special needs education program, for which we adjusted the formulations to reduce the question complexity, while the content remained the same.

Participants

Primary schools in Flanders were randomly recruited via e-mail using a standard information form accompanied by a personalized message. Schools could reply if they were interested to participate in the study.

Interviews were held in-person in the classroom with the investigating researcher presenting the material and the regular teacher observing the proceedings. Inclusion criteria were: students in the fourth, fifth or sixth grade, physically present in the class and with sufficient mastery of Dutch. In total, 240 children of ten schools met these criteria and were included in this research.

Parents of the participating children were notified at least one week prior to the interview with an information letter. Students received a similar message, explaining the research at their level. These letters were either sent out by the teacher using the online school platform 'Smartschool' or printed and handed out.

Interviews were carried out in Dutch by the same investigator between March and October 2022.

This study was approved by the Ethics Committee UZ KU Leuven (MP018531).

Interviews

The interview guide consisted of ten true/false questions clustered around six topics: prevalence, symptoms, life cycle, treatment, transmission and prevention strategies (2,5,10,17,19,26,27). Students were asked to respond to the statement by showing a true/ false sign. Their answers were counted, and the correct answers were discussed, followed by an explanation of each topic. This survey was followed by the reflective part consisting of six questions to assess their perceptions, feelings and beliefs on head lice (2,10,21,22). Students could raise their hands if they wanted to contribute, and the investigator could explore these topics more in depth.

Data-analysis

We used the QUAGOL method, which is a comprehensive guide for qualitative data analysis (11,12). Interviews were transcribed verbatim, along with a brief summary of practical information describing each participating school.

Next, interviews were read through multiple times, using pen and paper to mark specific statements and write down impressions and thoughts. Each of these fragments were assigned a code manually. A conceptual interview scheme was arranged in preparation of the actual coding process.

During that coding process, the concepts were listed and backed up by representative statements from participants. Results were put into tables for an inter- and intra- dimensional comparison of primary schools. The educational part generated numeric data - for which we created a dataset and used descriptive statistics– next to the qualitative data in the form of quotes. From the reflective part we identified the following main topics: misconceptions, attitude and disclosure paired with their individual subtopics. Analysis of the transcribed data was performed in the original language in which interviews were conducted (Dutch). Quotes from participants in this paper were translated to English.

Results

Socio-demographic characteristics of participants

Thirty-one percent of the schools (10/32) that were contacted, were included in this study. The selection of the schools reflects a balanced representation from the current landscape of free subsidised, free official and the community education in Flanders (Table 1). Each school is denoted with a capital letter. The student's statements are marked by that letter and a number (e.g. Student M.1: first quote from a student in school M).

A total of 240 students from ten schools participated in this qualitative research. Each included school proposed one class from either the fourth, fifth of sixth grade to take part in the interview. One school asked if every grade could be included, which adds up to a total of 12 classes divided over ten schools in Flanders. We included schools of varied sizes with a mean class size of 21 students (SD ±5). One school was part of special education program which explains the small class size of eight students. Geographically, schools were spread across Flanders.

Table 1: characteristics of ten participating primary schools (13,14)

	School network	Class	Class size	School size
School M	Free subsidized education	4th 5th 6th	20 19 17	402
School W	Free subsidized education (Special education)	4th	8	87
School J	Free subsidized education	4th	20	435
School A	Free subsidized education	4th	23	557
School V	Free subsidized education	4th	16	313
School S	Community education	5th	24	201
School L	Community education	5th	17	192
School B	Free official education	5th-6th	25	148
School R	Free official education	4th	26	315
School H	Free official education	5th	25	320

Data overview and identification of important concepts

Knowledge of students

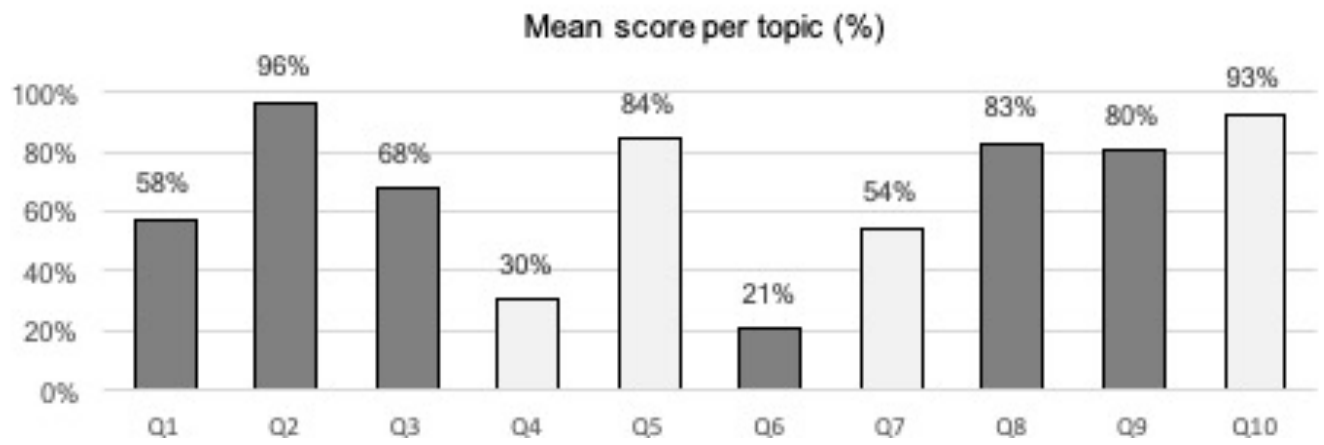
In the educational part of the interview, 240 students participated in a survey with ten true or false statements about six topics concerning head lice (see Table 2). The percentage of correct assessment was calculated using 240 as a total sample size. There was a small drop-out in collected data for one class of 23 students due to technical issues with the recording equipment. Therefore, question five and six could not be accounted for and were calculated with a different total sample of 217 (marked with * in Table 2).

An overall mean score of 63% (SD ±37*)* was achieved. Numerical data and distribution of correct answers are shown in Figure 1. The topics

Table 2: results from knowledge quiz of 240 interviewed primary school students

Topic	True/false questions	N (%)
Prevalence	1) *Head lice are not occurring that frequently any more. A maximum of 2% of primary school children has experienced head lice (false).*	138 (58%)
	2) *Head lice can only occur in children. My parents or grandparents cannot become infested (false).*	231 (96%)
	3) *Girls are more frequently infested with head lice than boys (true).*	162 (68%)
		Mean score 74%
Lifecycle	4) *Most often the heads of children - who wash their hair the least - are the place where head lice like to live the most and reproduce (false).*	73 (30%)
	5) *The eggs of lice are encapsulated in a shell, which is called a 'nit' and the young lice that hatch from it are called 'nymphs'. Those nymphs will grow to become adult lice (true).*	183 (84%) *
		Mean score 56%
Transmission	6) *Head lice can jump from one student to another when they are sitting next to each other on a school bench (false).*	45 (21%) *
		Mean score 21%
Symptoms	7) *The itchiness I experience when I am infested with head lice is because of the crawling of those parasites on the skin of my head (false).*	130 (54%)
		Mean score 54%
Treatment	8) *Without treating the head lice, they will die on their own and disappear (false).*	198 (83%)
	9) *The best way to get rid of head lice is by using a 'louse comb' in hair that is rinsed with conditioner (true).*	193 (80%)
		Mean score 81%
Prevention	10) *It's best to also check my siblings for head lice when I am infested (true).*	222 (93%)
		Mean score 93%
		Total mean score 63%

Figure 1: bar chart of mean scores per topic



of treatment and prevention strategies scored well. The knowledge of head lice prevalence was good. The lower score on the topic of lifecycle was mostly due to the misbelief that head lice infestation is associated with poor hygiene (30% correct answers on question 4).

Most striking were the student's misconceptions about the route of transmission. In almost every class, the majority of students thought that lice could jump from one person to another. This resulted in only 21% correct responses on this topic.

Reflection of students

The following themes were discussed in the reflective part of the interview using six questions: experience with head lice, feelings of shame, fear, disgust, disclosure towards parents, disclosure towards friends/class teacher and lastly the adjustments of daily activities when they were informed that a classmate was infected. The sixth question was if they had been confronted with head lice in places outside of school. This was a concluding question, to open the reflection and to check if they had understood the material. In the analysis three important themes became clear. They are discussed here below, supported by quotes from the interviews.

Misconceptions

Despite the fact that many primary school children have encountered head lice at a given time in their life, several misconceptions still exist. This is illustrated by the quantitative results in table 2, as well as by the following statements and questions.

Student M.1: One time I really knew for sure that I got them from my cat!

Student A.1: I once read this article about a girl who was infected with head lice for about five years and then she died because too much blood had been sucked away.

Attitude

Three subtopics were recurrent during every conversation: feelings of shame, disgust and fear, the value of friendship and behaviour/exclusion.

Feelings

The feeling of shame was not often communicated by students. It was closer to a feeling of fear about the way others would react or the physical experience that accompanied the infestation. Some students stated that the idea of being a host to parasites is not very pleasant. Feelings of fear were mostly grounded in poor understanding and irrational beliefs.

Student M.2: I wouldn't really be ashamed, but I wouldn't find it pleasant either when someone would say 'yuk, that is gross'.

Student S.1: Other children automatically think that they can't come near you because otherwise they might get infected. On the other hand, I do understand them because they just want to be cautious.

Student S.2: I find it gross when I know that there are insects in my hair. When I think about it too much, I get grossed out.

Student A.2: I'm sometimes a bit afraid, 'I hope my hair doesn't fall out because of all the combing and the shampoo, I hope those lice don't make me scratch too much and what if they make scars on my head and start sucking blood…'.

The value of friendship

This value appeared to be a priority to many students. Friendship was a valid consideration when they were asked if they wanted to sit next to a classmate if it was known that he/she was infected.

Student H.1: If it's really one of your best friends with whom you play every day, then I would definitely sit next to them.

Student S.3: I would tell my friends 'I am going to keep my distance now, but we can still be friends, we can still hang out together'.

Behaviour/exclusion

An important consequence when disclosed that somebody has head lice, is the fact that people tend to behave differently. Exclusion of classmates can occur and friendships or even family bonds can be affected.

Student M.3: I would be a bit scared of their reaction that they would refuse to play with me fearing transmission.

Student V.1: I regretted having head lice because we weren't allowed to hug anybody and, on the couch, my family used to always sit together but then they had to keep some distance from me.

Disclosure

It is known that head lice spread readily between young children, especially in primary schools. Regularly, a symptom-free-period of two weeks precedes the onset of pruritus. This can lead to 'silent' transmissions because head lice can freely infect other children if there is close head-to-head contact (15). On top of that, there are - as mentioned above- negative feelings and misconceptions that may interfere with open communication.

We looked into the disclosure of students towards three important actors in this health issue.

Disclosure towards parents

Students seem to know why it is important to be honest to their parents so that they can help. Moreover, it is clear that most parents know how to approach this problem appropriately. On the other hand, a rigorous treatment is time consuming and needs consistency. Guidelines advise to comb the hair for fourteen days straight (using a special comb), which can be a lot of work for parents. As mentioned before, parents can react with disgust which makes it harder for children to confess. Some students impersonated the reactions of their parents in a dramatic way during the interview. Other parents stay very calm and immediately act responsibly.

Student M.4: I would instantly tell my parents because they are the ones who can do something about it. My mother would say 'let's go to the pharmacist to buy a comb or shampoo', but she most certainly would not overreact.

Student H.2: When I tell her, my mom always sighs because she knows how much work it is. But then again, she knows that I can't help it.

Student A.3: My mother always reacts in the same way. Firstly, she's really stressed out and panicked and she begins to call everybody: 'do you have head lice, who has head lice?' and then she calls the pharmacist…

Disclosure towards school (teacher)

A large majority of students stated that they could be honest with their teacher. Only a few individuals stated they would be reluctant to tell their teacher. This largely depends on whether or not they have a good rapport with the teacher. In general, the interviews revealed that it is typically the parents who inform the teacher or school, not the student him/herself.

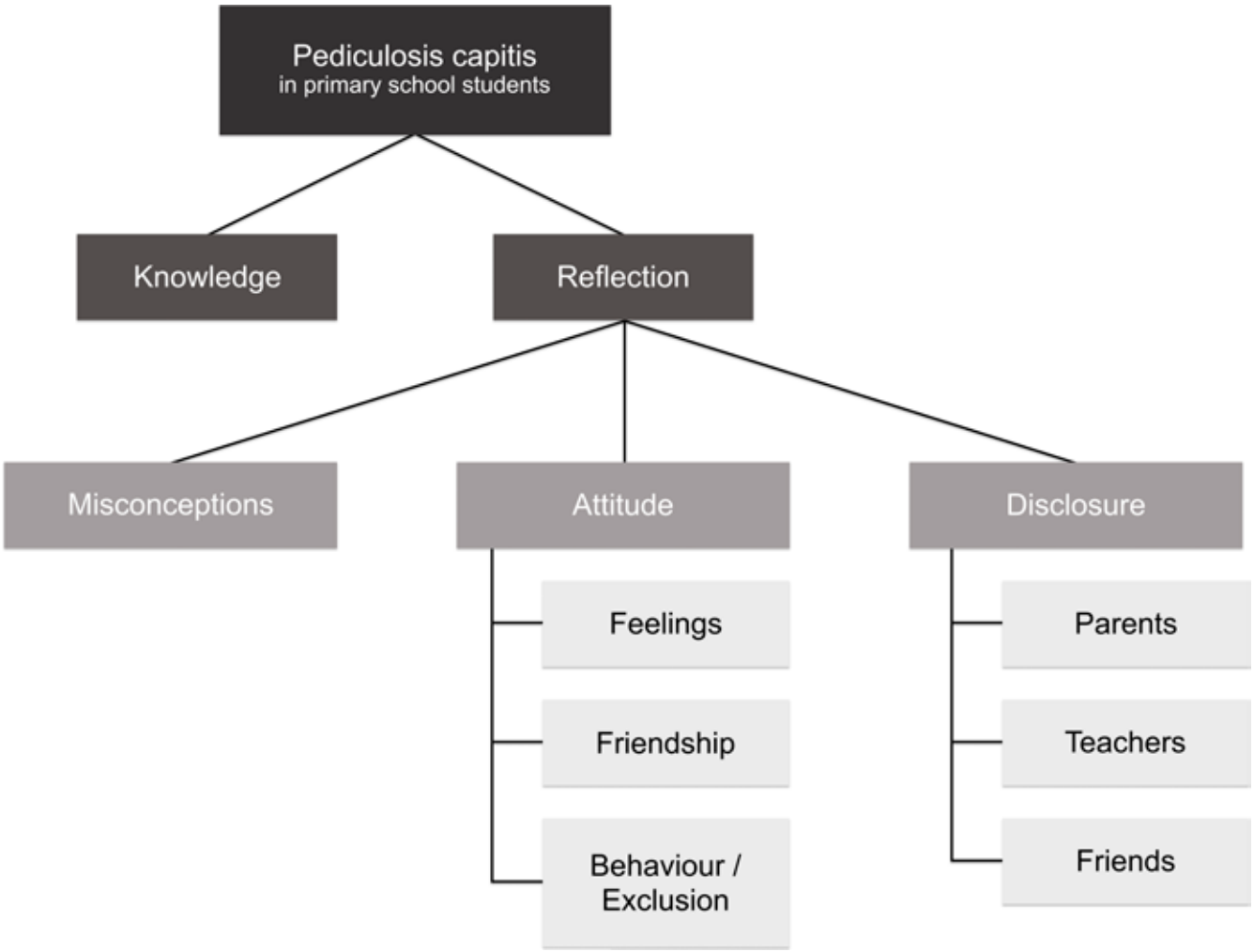
Student M.5: I would only tell her if it has already disappeared, and I no longer have them.

Student W.1: I once told my teacher that I had head lice and she reacted very surprised. Right? And then you immediately told mister X (another teacher at school).

Disclosure towards friends

The friendship with an infested classmate usually minimized their own reaction to the news. On the other hand, disclosing an infestation is not

Figure 2: conceptual overview of the knowledge and perceptions in head lice in primary school children



always easy. When asking them what they would say if a friend came to them with this news, they stated that they would react supportively.

Student S.4: I sometimes find it hard, I have some trouble telling it, because I'm scared of how they might react.

Student H.3: I would not find it gross, I think I would not react in a mean way. I would say 'oh that's too bad, I hope they go away soon.

Discussion

Student knowledge of Pediculosis capitis

The knowledge test showed that participating students are familiar with the subject-matter, oftentimes through their own experiences. Some topics were well understood, such as treatment and prevention strategies. However, the topics 'lifecycle', 'symptoms' and 'transmission routes' of head lice scored poorly, with a 21% correct answer rate in the latter. This heterogeneity in knowledge, was also found in the quantitative study of Sidoti et al (7). Their research used multiple-choice questions and reported only 60% correct answers. Due to the simplicity of their questions a higher score should be anticipated according to the researchers (Sidoti, 2009). In contrast to our finding, Italian students showed less understanding on the topic of prevention. Researchers suggested educational interventions to train students in order to decrease head lice infestations. Yingklang et al. demonstrated this by providing health educational material to an intervention group of schoolgirls compared to a control group (8). Not only did the educated students score better on the questionnaire, but a significant decrease of head lice infestation rate was observed accompanied by a lower incidence of new cases at two months after the intervention.

An important source of misinformation seemed to be cartoons and other media that children watch. The biggest misunderstanding in our cohort was that children believe head lice can jump from one head to another, when in fact they are transmitted by direct head-to-head contact. Head lice cannot fly nor jump, but they keep being presented that way in mainstream media (16,17). For example, an educational magazine used by teachers, principals and school management in Flanders, has an informative video on their website that shows 'jumping head lice' (18). This is rather unfortunate, because the remaining information they supply is correct and they are thought of as a well-established and trustworthy information source for schools. Not a single student was able to correctly answer all ten questions. However, our participants stated that they had gained new insights and talked openly to one another with better understanding than at the beginning of the interview. This indicates that simple interventions on class level could be particularly useful in educating children on head lice.

Student reflections on infestations with Pediculosis capitis: misconceptions, attitude and disclosure.

Misconceptions

Apart from the abovementioned 'jumping of head lice', some other misconceptions were discussed during the reflective part. A recurring

theme was the perception that head lice were able to live on body parts other than the head (i.e. lice crawling over their face or climbing up via hands and arms). Another misconception was that students seemed to be convinced their pet animals could be the source of head lice. This was also listed as a common myth in the article of Clore, et al. (1989), illustrating that false information and insufficient knowledge have been present for decades (19).

Attitude

As a very common and long-existing public health issue, pediculosis capitis had been researched thoroughly over the last decades. The systemic review of Hatam-Nahavandi illustrates this as well, covering topics such as prevalence and worldwide infestation rates (3). However, evidence-based studies about the emotional impact of head lice on school-aged children are scarce. Some research has been conducted to evaluate knowledge and perceptions of schoolteachers or parents (20,21,22). Unfortunately, the population that most often deals with head lice –three- to eleven- year olds – have not often been interviewed. One exception is the research conducted by Purdy & True (23). Using drawings and child-centred interviewing, ten children described feeling sad, embarrassed, dirty, and scared. We hypothesized that students would report feelings of shame when infected, which surprisingly was not often mentioned. Firstly, children did not seem very ashamed overall, as they were most of all concerned with other people's comments. They feared the reaction of their classmates and friends and expected to be excluded by them. Secondly, the physical symptoms accompanying head lice infestations (e.g. itchiness) were reported more often than shame. The itching, tickling feeling and the sometimes-painful treatment strategies (e.g. a fine lined metal hair comb) were reported as 'very unpleasant'. Students sporadically mentioned fear. The idea of hosting a parasite was scary to some because of their blood sucking capabilities. They feared that excessive scratching could lead to scarring.

An important theme was the value of friendship. Students stated their friendship to be most important and did not really mind the infestation in their friends. This is an illustration of the importance of friendship in primary school pupils. Being part of a group and being accepted by your peers is not only vital to the child's wellbeing, but it is also 'one of the most powerful predictors of mental health and behaviour into adulthood' (Sherman, 2000) (24).

An important consequence of head lice infestation is the environment's reaction. Family and friends will behave differently to minimize transmission risk to siblings and avoid major outbreaks at school, respectively. This can lead to exclusion from participating in activities on the playground or in the classroom. Some interviewees answered they would indeed refuse to sit next to an infected classmate to protect themselves. Others talked about the consequences they experienced, from feeling lonely because they could no longer sit close to their family members to enduring bullying by siblings.

In the past decades there has been some controversy on whether to exclude infected children from school. Some literature reports a 'no nit policy', which states that children with nits should be removed from school until they are treated, and all visible nits are removed (25). However, this approach is unscientific because children with nits alone are not infectious (nits are empty eggshells). School exclusion would only harm the students socially and emotionally as it would interfere with their education. In Belgium, the VWVJ (i.e., Flemish scientific association for youth healthcare) clearly states that students should never be excluded from school (5,26,27). Reasons given are the presence of asymptomatic carriers (who are infectious but not diagnosed) and the lack of evidence that would support a 'no nit policy'. Only one interviewee reported to have stayed home from school when infested with head lice.

Disclosure

Van der Wouden, et al. describe the social impact and reaction of parents in particular (6). Apparently, parents often react with shock and revulsion. This response is seated in the deep-rooted misconception that head lice are associated with poor hygiene, which is not the case. The article correctly describes difficulties in tracing the source because shame and social stigma make parents reluctant from disclosing this information. This could complicate contact tracing. However, the results from our research do not indicate that this barrier (informing the parents) is present in Flemish schools. We observed that students stated they would openly tell their parents. We learned that some parents react rather with disappointment to an infestation - especially because of the trouble of treating and combing the hair (based on testimonials of their children). This can take up a lot of time and asks for consistency (28). Some rather panicked reactions have been reported. Yet, most of the parents remained calm according to the children, they consoled them and stated they would take the proper eradicating measures. Parallel with the student's honesty towards their parents, the same statements were made about informing their teachers. Most students did not hold back in telling their teacher, depending on how much they liked their current teacher and if they believed teachers would inform other staff members.

Strengths and limitations

The strength of this research lies in its qualitative nature. The ability to directly ask questions and gain deeper insights behind the reasoning of students, provides a thorough investigation. Furthermore, school-aged children have not been investigated often despite the fact they encounter this health issue most often. The assessment of their knowledge, attitude and perceptions attempts to fill the gap in evidence-based research in this area. The weakness is the possible confirmation bias and peer pressure that occurs when interviewing a group of people - especially children- simultaneously. In the educational part, students could observe which answers their classmates gave. This could make them change their instinctive beliefs – making the results less trustworthy. This problem was observed in the first class we visited. Some adjustments were made to decrease this problem by asking the students to close their eyes before responding in order to be less influenced by their classmates' answers. This method was carried on for the rest of the interviewing process.

Conclusion

By conducting this qualitative research using semi-structured interviews with primary school, we were able to assess their knowledge on the topic of *pediculosis capitis*. A considerable hiatus was observed regarding the head lice's transmission route. We also identified the main concepts in their reflection. These concepts include misconceptions, attitude (feelings, friendship and behaviour) and disclosure (towards parents, teachers and friends).

It is important for children to be well educated and to be able to speak openly about their beliefs and feelings on this topic. Schools should provide them with health education programs, which would benefit not only the student's wellbeing, but can also be of crucial importance in reducing transmission rates.

Conflict of Interest Statement

The authors declare that there are no conflicts of interest with regards to the acquisition and reporting of the data of the study presented in this manuscript, all procedure were in line with the editorial policy of the Belgian Journal of Paediatrics

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