

A Survey on the Knowledge of Clinical Signs of Child Maltreatment among Preschool and Primary School Teachers

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Keywords

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Abstract

Background

Child abuse and neglect are critical health issues with far-reaching physical, psychological, and social consequences. Teachers are uniquely positioned to identify signs of abuse due to their daily interactions with children. However, limited knowledge and training often impede effective identification and reporting of abuse. This study assesses the knowledge of preschool and primary school teachers in Flanders, Belgium, regarding the clinical signs of child abuse.

Methods

A prospective study was conducted using an online survey comprising 16 hypothetical cases. The cases, validated by pediatric and forensic experts, included both suggestive and non-suggestive scenarios of child abuse and neglect. Participants rated their level of suspicion using a Likert scale. Statistical analysis explored the relationship between socio-demographic factors and participants' ability to correctly identify cases.

Results

A total of 155 completed surveys were analyzed. Participants achieved a median accuracy of 75% overall, performing better on suggestive cases (87.5%) than on non-suggestive (62.5%). Sensitivity in identifying abuse was higher than specificity, with significant variability observed in non-suggestive case results. Prior training did not significantly improve scores, likely due to the superficial nature of existing training programs. Years of experience and prior exposure to suspected abuse cases also showed no significant correlation with performance.

Conclusion

While teachers demonstrated reasonable knowledge of child abuse and neglect, they sometimes struggle in recognizing non-suggestive cases and distinguishing abuse from mimickers. Further research is needed to evaluate the impact of standardized training programs on improving teachers' ability to detect and report child abuse and neglect effectively.

Introduction

Child abuse and neglect represent significant global health concerns, affecting children across all socio-economic backgrounds (1). Despite their impact, these issues often go underreported. Prevalence data stem from official reports, capturing only a fraction of affected children (2). A significant discrepancy exists between self-reported cases and official records (3).

The World Health Organization (WHO) defines child abuse and neglect as "all forms of physical and/or emotional ill-treatment, sexual abuse, neglect, and exploitation resulting in actual or potential harm to a child's health, development, or dignity." The four primary types are physical abuse, sexual abuse, psychological abuse, and neglect (4).

Child abuse and neglect have both immediate and long-term physical, psychological and social consequences (1). Victims often face lifelong mental-health issues, including high-risk behaviours and maladaptive coping strategies, as well as physical harm from the abuse itself. Recognizing early warning signs, or "sentinel injuries", such as minor bruises, can be life-saving and help prevent the long-term physical and psychological impacts of abuse (5). Overlooking early signs increases the risk of repeated harm, with up to 50% of affected children experiencing further abuse (6).

Physical abuse often manifests through visible signs. While bruises are common, their location, pattern, and number can indicate abuse. For example, bruises on the shins and foreheads are typically accidental, whereas those on the buttocks, cheeks, or thighs are more suspicious. Bruises on the neck, ears, and

genitalia are highly concerning (1). Other signs include bite marks, burns, and fractures, especially if injury explanations are inconsistent (1).

Beyond physical signs, school-aged children experiencing abuse often show emotional, behavioral, and cognitive symptoms (7). Studies indicate that neglected children display externalizing behaviors (e.g. aggression) and internalizing symptoms (e.g. anxiety, depression). They may exhibit ADHD-like symptoms, emotional dysregulation, and reduced cognitive abilities, affecting academic performance and social interactions (7,8).

Teachers play a key role in identifying abuse due to their daily interactions with children. They can observe changes in appearance, behavior, or academic performance that signal maltreatment. Furthermore, they build trusting relationships with their pupils which can encourage children to disclose maltreatment (2,7). Parent-teacher meetings offer additional insights into family dynamics. However, many teachers lack training in recognizing and reporting abuse, leading to underreporting (2). Identifying neglect is particularly difficult, with teachers often unsure about recognizing and reporting it (7).

In Flanders, Belgium, "Confidential Centers for Child Abuse" facilitate the reporting of abuse. In 2023, these centers recorded 7,541 reports involving 10,671 children. The reported cases included emotional abuse or neglect (36%), physical abuse (30%), sexual abuse (16%), and general risk situations (15%) (9).

Few studies have examined teachers' knowledge of child abuse and neglect. An Estonian study found that insufficient knowledge reduced the likelihood of reporting (10). Another study showed that training significantly improved teachers' ability to recognize and report abuse (11).

This study assesses preschool and primary school teachers' knowledge of clinical signs of child abuse and neglect in Flanders through an online survey using hypothetical case reports. We hypothesized that there is a gap in teachers' knowledge on this topic.

Methods

Study Design

This prospective study was conducted through an online survey and received approval from the Research Ethics Committee UZ/ KU Leuven (MP028816). The study protocol was modeled on two prior investigations conducted by our research group but focused on a different population (12,13). Participation was voluntary, anonymous and required informed consent.

The survey consisted of two sections: a questionnaire gathering sociodemographic information and 16 hypothetical cases. The sociodemographic variables collected included gender, age, parental status, type of education (mainstream or special education), years of professional experience, prior exposure to potential cases of child abuse and neglect, province of residence and education regarding child abuse and neglect. The 16 fictional clinical cases (Table 1) presented scenarios of potential child abuse or neglect, accompanied by a clinical image showing signs of injuries or neglect as well as symptoms not related to abuse. All cases were situated within a school context.

Participants were asked to evaluate their level of suspicion regarding child abuse and neglect using a Likert scale with response options ranging from "not suspicious", "rather not suspicious", "neutral", "rather suspicious" to "highly suspicious". By offering gradations we aimed to reflect nuance that may occur in real life. The 16 cases were developed based on medical literature and validated by a panel of five experts in the field. Eight cases

were designed to be non-suggestive of child abuse and neglect, while the remaining eight were suggestive of such instances. As the cases were never black/white with regards to the presence or absence of abuse or neglect, the expert answers did not always have to be perfectly consistent, but always had to concur regarding the direction of the suspicion (e.g. both "not suspicious" and "rather not suspicious" could be used by the experts in their opinion of a specific case, but not "rather not suspicious" and "rather suspicious"). We dichotomized the correct answers after the survey was performed to allow for clearer statistical analysis of response accuracy. After completing the survey, participants received feedback on the cases.

The online survey was distributed via the platform 'LimeSurvey'. The survey was distributed on April 17, 2024. Data collection occurred from 17 April 2024 until 28 May 2024. Only fully completed questionnaires were included in the analysis.

Participants

Primary and secondary school teachers were recruited via email, which was distributed to school administrations in Flanders, Belgium. These email addresses were sourced from an official database provided by the Flemish government (14). The email contained a voluntary invitation to participate, along with a direct link to the survey. An information letter was attached, explaining the study's objective, methodology, implications, and outlining any potential risks and benefits of participation. Participation was entirely voluntary and fully anonymous, with informed consent obtained prior to the initiation of the survey.

Statistical analysis

Only questionnaires that were fully completed via LimeSurvey were included in the analysis. IBM SPSS software was used to perform all statistical analyses. Categorical variables were expressed as frequencies and percentages. For analysis purposes, responses were dichotomized: "unsuspicious" and "rather not suspicious" were grouped as "not suspicious," while "rather suspicious" and "highly suspicious" were categorized as "suspicious." The "neutral" option was consistently treated as incorrect.

Each case was reviewed by pediatric experts with clinical or forensic experience. Participant responses were then compared to these expert assessments, and an overall score was calculated for each participant, reflecting their ability to correctly identify potential cases of child maltreatment.

The proportion of correct answers for each case was calculated and visualized using a Likert plot. Normality of continuous variables was evaluated with the Shapiro-Wilk test. These variables are reported as mean ($\pm$ standard deviation, SD) or median ($\pm$ interquartile range, IQR), depending on the distribution. Categorical variables are expressed as frequencies and percentages. ANOVA tests were conducted to assess whether there were significant differences in overall scores between groups within each sociodemographic variable (such as gender, parental status, prior experience with child abuse cases, province of residence, type of education and education on child abuse and neglect). Pearson correlation tests assessed relationships between continuous sociodemographic variables (age and years of professional experience) and the overall score. Finally, linear regression was performed to determine if gender, age, parental status, years of professional experience, prior exposure to potential cases of child abuse and neglect, province of residence, type of education and education regarding child abuse and

TABLE 1: Case scenario description of the survey.

	Vignette	Image description	(Not) suggestive for child abuse and neglect
Case 1	Bruises on lower legs. Victor is an energetic 9-year-old boy in the third grade. He has trouble sitting still in class and often struggles to focus on the lesson. On the playground, he stands out as one of the more “active” kids. You notice his shins are covered in bruises. When you ask what happened, he says he’s fallen several times while skating.	Clinical image of the lower legs of a child showing multiple ecchymoses on both shins.	Not suggestive
Case 2	Fall from bicycle. Noor, a 4-year-old girl in preschool, is currently in the second year of kindergarten. Her mother shared that Noor had a fall over the weekend while practicing riding her bike without training wheels. This happened while she was staying with her grandparents. Concerned about her injuries, Noor’s grandparents took her to the general practitioner, where her scrapes were carefully treated. Fortunately, aside from a few bruises and scrapes, Noor did not sustain any serious injuries.	Clinical image of a child with multiple superficial abrasions on the face, predominantly on the forehead and right cheek.	Not suggestive
Case 3	Bruise on ear. Liam, a 4-year-old boy, is in your preschool class. He is quiet and shy. During a coloring activity, you notice a bruise on his ear. When you ask him about it, Liam does not want to say how it happened. After school, you decide to ask his mother. She explains, “His older sister was jumping rope with a plastic rope yesterday, and Liam got hit on the ear.” Liam’s mother is a single parent who has been struggling financially since her divorce.	Clinical image of a child’s ear showing an ecchymosis located at the antihelix and scapha. The remainder of the ear appears normal.	Suggestive
Case 4	Bedwetting. Sofia, a cheerful and lively 5-year-old girl in her final year of preschool, has seemed quieter and less enthusiastic over the past two weeks. She cries more often and shows less engagement during classroom activities. Notably, she has wet herself twice in the past week, which had not happened before. Concerned about these changes, you speak with her father at the school gate. He explains that Sofia’s mother, An, gave birth to a baby boy a month ago. Things have been very hectic at home, and they realize that Sofia is struggling with this major change. He appreciates your concern and thanks you for bringing it up. He says he will discuss with his wife what they can do to help Sofia feel better again.	Image of a young girl standing alone, visibly crying.	Not suggestive
Case 5	Naevus on the back. During a school trip to a water park, you notice that Charlotte has a blue mark on her back. Since this area is usually covered by clothing, it’s the first time you’ve seen it. Charlotte is an 8-year-old, very enthusiastic girl. You ask if she had a fall, but she explains that she has had this mark since she was very young.	Clinical image of a congenital nevus measuring approximately 2x3 cm. The macula has a flat surface and appears reddish in color with irregular borders.	Not suggestive
Case 6	Cigarette burn. Timo is a somewhat hyperactive boy in the fifth grade of elementary school. He has ADHD and is often very difficult to keep under control. Despite his efforts, he has had to repeat a year, and his academic performance doesn’t seem to be improving this year either. You have the impression that his parents provide him with little support and leave him to handle things on his own. Today, he enters the classroom with a round wound on his forearm that, at first glance, resembles a burn. Timo says he bumped into something and quickly hides the wound under his sleeve.	Clinical image showing a circular second-degree burn wound, approximately 0.5cm in diameter, caused by a cigarette. The wound is surrounded by an erythematous border.	Suggestive
Case 7	Burn. Sofian, a fourth-grade student, arrives several hours late to class today with a bandage on his right forearm. His mother apologizes and explains that Sofian spilled hot tea on his arm this morning. They went straight to the emergency room, and fortunately, it is only a superficial second-degree burn, so they were allowed to go home quickly. She politely asks if Sofian could skip gym class today.	Clinical image of a boy with his right arm resting on his leg, wrapped in a bandage. His left hand supports the right arm.	Not suggestive
Case 8	Bite wounds on thighs. During gym class, you notice that Merel has a wound on the inside of her thigh, which resembles a series of bite marks. The girl herself says that her cat bit her. Merel is 10 years old and part of a family with five children. Since her family has only been at the school for a few weeks, you don’t know her parents yet. However, a colleague mentioned on the playground that the family lives in social housing near the canal and that both parents are currently unemployed.	Clinical image showing the inner thigh of a child with three reddish lesions. The lesions have a bite-like pattern, with a size and shape consistent of an adult’s dentition.	Suggestive

	Vignette	Image description	(Not) suggestive for child abuse and neglect
Case 9	Bite wound on the cheek. Oliver and Noah are twins in the final year of kindergarten. Noah has a bite mark on his cheek. He says, "My brother did that." Oliver later confirms the story. This doesn't surprise you, as the brothers often have rough fights. Their mother did not mention this incident this morning, likely because she always seems rushed to get to work on time.	Clinical image of a young child with a circular, red lesion on the cheek. The lesion has the shape of child's dentition and appears as a small, superficial bite wound.	Not suggestive
Case 10	Poorly treated wound. Just before the Easter break, Lina fell on the playground while playing tag, resulting in quite a large scrape. The wound was immediately taken care of. Now, two weeks later, Lina is back in your class. The wound looks quite concerning, with yellow crusts and a red edge. You decide to clean it thoroughly and put a bandage on it. Lina mentions that her dad didn't think a bandage was necessary, believing it would heal on its own. After school, you inform her father that you think the wound might be getting infected. His response is brief, emphasizing that he knows how to care for a scrape.	Clinical image of a knee of a child with an abrasion covered by a yellowish, purulent crust. The wound margin appears red and inflamed.	Suggestive
Case 11	Cold and few clothes. It is February, and the weather has been very cold for several weeks. Milan, a 7-year-old boy, comes to school without a coat for the third time this week. His clothing is clearly not suitable for this cold weather. While supervising the playground, Milan comes over to you, shivering, and says, "Teacher, when is the break over? I'm very cold." He explains that he simply forgot to put on his coat. This reminds you about the fact that he has forgotten his lunchbox several times this school year.	Clinical image of a boy standing outside, wearing only a sweater. He visibly appears cold, with flushed cheeks.	Suggestive
Case 12	Behavioral regression. Finn is a 7-year-old boy in the first grade. He is slightly behind his classmates, but with a bit of extra help, he manages to keep up with the material. However, you've noticed a significant change in Finn's behavior over the past week. He appears withdrawn and barely wants to talk. It almost seems as if he has forgotten everything he learned over the past few months. At the school gate, you observe his father responding to Finn in a noticeably cold manner. When Finn tries to talk about his day, his father ignores him.	Image of a young boy walking hand in hand with his father towards the school exit.	Suggestive
Case 13	Vegan diet. Jebbe is starting his first day of kindergarten today. His parents explain that they are raising him with a strong emphasis on ecological awareness. The family follows a vegan diet (excluding all animal products), but this is done in consultation with their doctor to ensure that Jebbe receives all necessary nutrients and vitamins. The parents kindly request that the school takes this dietary preference into account. While reviewing Jebbe's medical information, you notice that he has only received the mandatory polio vaccinations.	Image of a young girl serving her plate from a bowl filled with various vegetables.	Not suggestive
Case 14	Bruises upper arm. Mila is a 10-year-old girl. Her parents divorced a year ago, and she now lives with her mother and stepfather. The transition has been particularly challenging for her, especially given her mild form of autism. Today, you notice several bruises on her upper arm. She tells you that she fell during gym class. Concerned, you ask the gym teacher if they saw anything, but he did not see Mila fall during the sport lesson.	Clinical image of a girl's left upper arm showing multiple ecchymoses. The bruises are scattered across the upper arm and have a pattern suggestive of finger grip marks.	Suggestive
Case 15	School absence. Simon, a 9-year-old boy, has already missed school 8 times this year. Even though the school year has only been underway for two months. A few absences were accompanied by a doctor's note, but the majority remain unexplained. This pattern of absence is starting to take a toll, as Simon is struggling to keep up with his peers. Simon himself is a reserved child with few friends in the class. Additionally, his mother is at home dealing with depression, and his father works as a laborer in a construction company.	Image of a boy sitting on the corner of a bench, looking down at the ground. He appears lonely and sad.	Suggestive
Case 16	Pulled elbow. In the morning, Ella's father approaches you. While playing with her father, 4-year-old Ella injured her elbow, which became dislocated. They went straight to the emergency room, where she was diagnosed with a "pulled elbow". Fortunately, the elbow was successfully repositioned. Ella is still experiencing some discomfort in her elbow. Her father kindly asks if you could keep an eye on how Ella is doing or other abnormalities. Despite this, Sofie appears happy and does not seem to have any other issues.	Clinical image showing a girl in a hospital emergency bed. Her left arm rests straight at her side, while her right arm is in use.	Not suggestive

TABLE 2: Socio-demographic characteristics of the participants.

	N = 155	%
Gender		
Male	9	5.8
Female	146	94.2
Age		
19-35 years	51	32.9
36-50 years	61	39.4
>50 years	43	27.7
Children of their own		
Yes	122	78.7
No	33	21.3
Numbers of years of work experience		
1-5 years	26	16.8
6-10 years	20	12.9
11-25 years	64	41.3
> 25 years	44	28.4
Been in contact with suspected child maltreatment		
Yes	113	72.9
No	42	27.1
Training for recognizing child abuse		
Yes	26	16.8
No	129	83.2
Type of education		
Mainstream education	128	82.6
Special education	27	17.4
Province of residence		
	N=155	%
Antwerp	32	20.6
Brussels	18	11.6
Limburg	25	16.1
East Flanders	26	16.8
Flemish Brabant	30	19.4
West Flanders	24	15.5

* per 100.000 residents in Flanders.

neglect could predict participants' overall scores. Statistical significance was defined as a p-value of less than 0.05.

Results

Participants

A total of 231 respondents participated in the survey, of whom 155 completed the questionnaire. Only fully completed questionnaires were included in the analysis. Table 2 provides an overview of the socio-demographic characteristics of the participants. The sample was predominantly female (94.2%). Among the participants, 17.4% worked in special education. The respondents had a mean age of 42 years old (IQR: 33-51). On average, participants had 18.7 years of work experience (IQR: 8-27), with only 16% having fewer than five years of experience, indicating a largely experienced cohort.

In addition, 70% of participants reported having previous contact with suspected cases of child abuse and neglect, highlighting the prevalence of this issue. However, only 16.8% of the participants had received training on recognizing the signs of child abuse and neglect.

Overall score

The overall median score of all the participants (n=155) on the 16 cases (compared to the categorization provided by the experts) was 75% (IQR: 68.75-81.25), corresponding to a median of 12 out of 16 correct responses (IQR: 11-13). Only 12 participants (7.7%) scored 8 or fewer out of 16. The lowest score observed was 43.75%, achieved by 2 respondents, while the highest score of 100% was achieved by 4 participants.

We analyzed the sub-scores for the cases suggestive of child abuse and neglect and the non-suggestive cases. In the analysis of the suggestive cases, the median accuracy was 87.5%, indicating higher sensitivity in identifying potential child abuse and neglect. Participants generally performed better on these cases. In contrast, the median accuracy for non-suggestive cases was 62.5%, reflecting the specificity of the participants in correctly identify cases not indicative of child abuse and neglect.

The proportion of correct answers per case is represented in table 3, while figure 1 A-B visualizes the proportion of correct answers using a Likert plot. The highest accuracy among the non-suggestive cases was for identifying bruises on the lower legs (78.1% correct), whereas the most challenging case involved a vegan diet (40.0% correct). Among the suggestive cases, participants achieved the highest accuracy in the scenario involving thin clothing in cold weather (97.4% correct), while the lowest accuracy was observed in the case involving a bruise on the ear (61.3% correct).

Relationship between participant characteristics and overall score

An ANOVA test was conducted to explore potential relationships between categorical sociodemographic characteristics and the overall score. The analysis found no significant differences between the mean scores of the different groups of the variables gender, parental status or previous contact with suspected child maltreatment. Similarly, there were no significant differences between the mean scores of the different groups based on training for recognizing child abuse, type of education or province of residence. The Pearson correlation analysis revealed non-significant correlations between the continuous variables (age and years of work experience) and the overall score. Finally a linear regression analysis was performed (table 4). None of the included variables were significant predictors of the overall score.

Discussion

Focusing on preschool and primary school teachers working in Flanders, Belgium, this study aimed to assess their knowledge of the clinical signs of child abuse and neglect and identify the contributing socio-demographic factors.

The majority of participants were women (94.2%) which is in line with the actual gender distribution among pre-school and primary school teachers in Flanders (87.2% female in 2024) (14). However, due to this distribution, we could not analyze the influence of gender on the overall score. Additionally, there was a slight overrepresentation of teachers working in special education compared to the 2024 average (17.4% versus 10% in Flanders)

(14). The sample demonstrated a balanced distribution across the different provinces in Flanders. There was a slight oversampling from the provinces of Limburg (25 teachers, 2.8/100.000 residents) and Flemish-Brabant (30 teachers, 2.5 per 100.000 residents). It is important to note that only Flemish-speaking schools in Brussels were contacted, which may explain the apparent underrepresentation of the Brussels region, as French-speaking schools were not included. Overall, this sample can be considered representative, comprising experienced teachers (averaging 18.7 years of work experience) relatively well distributed across all provinces in Flanders.

Overall, our results indicate that participants performed well on the questionnaire, with a median score of 75%, indicative of strong overall knowledge. A significant difference emerged when comparing scores on ‘suggestive’ versus ‘non-suggestive’ cases. Participants demonstrated a higher accuracy in identifying suggestive cases, with a median score of 87.5%, compared to 62.5% for non-suggestive cases. This suggests that sensitivity in identifying child abuse and neglect cases was higher than specificity. Additionally, we observed a greater variation in the results of the non-suggestive cases, indicating that participants found these cases more challenging. This discrepancy may stem from potential bias, as participants were aware that the study focused on child abuse and neglect, possibly heightening their sensitivity to such cases. While high sensitivity is crucial to

TABLE 3: Proportion of correct answers: per case.

Cases suggestive for child abuse and neglect		Cases not suggestive for child abuse and neglect	
Title	Correct answers (%)	Title	Correct answers (%)
Cold clothes	97.4	Bruises on lower legs	78.1
Burn cigarette	96.1	Bike fall	77.4
Bruises upper arm	95.5	Pulled elbow	70.3
Behavioral regression	95.5	Burn hot tea	64.5
Bite trauma upper legs	89.7	Naevus	59.4
School absence	89.7	Daytime wetting	55.5
Infected wound	76.8	Bite trauma face	43.9
Bruise on ear	61.3	Vegan diet	40.0

ensure that no cases are overlooked, an understanding of clinical signs that mimic abuse or neglect is equally important. For instance, a congenital naevus, often mistaken for a sign of abuse, was misidentified by 40.6% of the participants. Another example of a mimicker is bullous impetigo, a skin infection that causes erosions that can resemble cigarette burns (6). Distinguishing between inflicted injuries and similar-looking medical conditions or accidental trauma is crucial to avoid wrongful accusations against parents, which could damage trust between teachers,

children, and caregivers. Therefore, training programs should not only emphasize detection but also address common mimickers of abuse to improve diagnostic accuracy among preschool and primary school teachers. A study by our research group involving general practitioners and pediatricians in training also showed that suggestive cases were identified more accurately (12). However, a study with daycare workers found no significant difference between suggestive and non-suggestive cases (13).

It should also be noted that teachers can primarily play a role in the early detection and signaling of possible child abuse or neglect, based on observed clinical signs and behavioral changes. As previously mentioned, missing an early indicator increases the risk of repeated harm (6). In this context, a high sensitivity, even at the expense of some specificity, aligns with their preventive role. Further evaluation could be carried out by healthcare professionals. In Flanders, the school physicians of the CLB (Centre for Pupil Guidance) serve as an

FIGURE 1A: Cases suggestive for child maltreatment: best to least adequately solved.

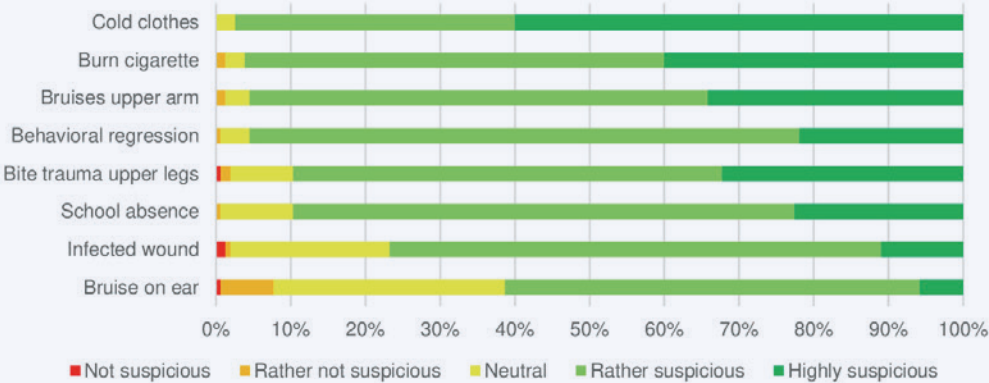


FIGURE 1B: Cases not suggestive for child maltreatment: best to least adequately solved.

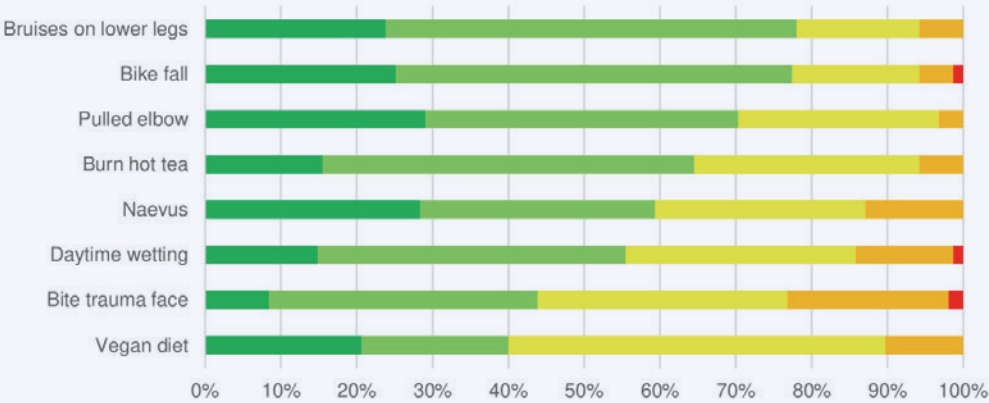


TABLE 4: Linear regression analysis: influence of sociodemographic variables on overall score

Socio-demographic variable		Standardized coefficients beta	p-Value
Gender	Male		
	Female	-0.027	0.758
Age		0.099	0.630
Years of work experience		-0.192	0.347
Children	No		
	Yes	0.110	0.235
Been in contact with suspected child maltreatment	Yes*		
	No	0.064	0.469
Training for recognizing child abuse	Yes*		
	No	0.054	0.521
Type of education	Special education*		
	Mainstream education	-0.019	0.843

* For categorical variables, the category marked with an asterisk (*) is the reference group in the regression model. The reported beta coefficients represent the difference in score compared to this reference group.

essential link between education and healthcare context allowing teachers to refer concerns while the physicians should consider the differential diagnosis and the level of suspicion regarding child abuse (15). This underscores the importance of raising awareness among teachers, not only about the signs of abuse, but also about how and where to access appropriate support.

In comparison to similar research on childcare workers, participants in this study achieved higher overall scores, with an average score of 75% compared to 67.8% (13). This difference may be partly explained by the design of the hypothetical cases used in the current research, which included direct quotes and statements from children. These verbal indicators likely offered additional context, facilitating the recognition of signs of abuse and neglect. The inclusion of such information could have contributed to the relatively high scores observed in our study. In contrast, young children in daycare settings are often pre-verbal, limiting the available information for assessment. It is also necessary to realize that the two surveys were not matched for level of difficulty, so any variation there could also contribute to the difference in overall scores.

We hypothesized that previous training would have a positive effect on participants' scores. However, we found no significant difference between participants who had received training on child abuse and neglect and those that had not. This may be due to the often superficial nature of training, with many participants describing their training as a one-time session. Such brief training sessions may be insufficient for addressing this complex issue. More in-depth, high-quality training could yield better results, as supported by findings in other studies where extensive training has shown a positive impact. A study with Turkish teachers showed that after a training on the clinical signs of abuse, the scores on a case-based survey about child abuse and neglect were higher than before the training (11). A meta-analysis also indicated higher knowledge levels among professionals working with children after training, though the evidence quality was low, necessitating further rigorous research (16). Research from Ireland highlights the suboptimal knowledge of teachers in training in recognizing child abuse and neglect, emphasizing the critical importance of

incorporating pre-service training (17). Finally, there is also a need for regular reeducation, as research indicates that knowledge levels tend to decline over time following a single training session (18).

Interestingly, greater work experience did not correlate with higher scores. This may be due to the relatively rare nature of child abuse cases, which present in diverse and often subtle ways. Even with years of experience, professionals may not encounter the full spectrum of signs associated with child abuse. This underscores the importance of proper training, as experience alone cannot replace the depth of knowledge gained through targeted education. An Australian case-based study supports the finding that teaching experience does not significantly improve scores on a case-based questionnaire. However, it does indicate that more experienced teachers are more likely to report suspected cases (19). Moreover, experienced teachers may less likely recognize signs of child abuse and neglect, as years of teaching experience could theoretically lead to increased tolerance and a reduced sensitivity to the issue (18). Furthermore, we did not observe higher scores among teachers who had previously encountered cases of child abuse during their careers. This could be explained -as mentioned above- by the large spectrum of abuse and neglect manifestations. Therefore, we suggest that training should focus on the diverse presentations of child abuse and neglect to improve overall detection.

Limitations

This study did not identify significant predictors for the overall score, likely due to the relatively small sample size (155 participants). Larger-scale research could provide more robust conclusions. Additionally, the survey's reliance on hypothetical cases may not fully replicate real-life scenarios, where teachers have access to broader contextual information, such as ongoing interactions with the child and insights from caregivers. The survey's explicit focus on child abuse and neglect may have heightened participants' vigilance, potentially influencing their responses. Moreover, the voluntary nature of participation could introduce selection bias. The variable quality and format of prior training among participants also made it challenging to draw firm conclusions regarding its impact. Future studies should prioritize systematic and comprehensive training to assess its effects on improving recognition of child abuse and neglect. Another limitation is that we did not investigate teachers' knowledge of reporting pathways or available sources of guidance when evaluating such situations.

Implications

This study provides a snapshot of current knowledge levels regarding child abuse and neglect among preschool and primary school teachers. It underscores the need for further research to identify the various factors contributing to this knowledge. Future studies should prioritize evaluating the impact of comprehensive and standardized training to determine how it might enhance detection accuracy and awareness. Expanding research in this field could lead to more targeted interventions that effectively help teachers and other professionals working with children to better recognize and respond to signs of abuse and neglect.

Conclusion

This study provides valuable insights into the knowledge of preschool and primary school teachers in Flanders regarding the clinical signs of child abuse and neglect. Although teachers generally performed well on the survey, a gap was observed in recognizing non-suggestive cases.

No significant predictors for knowledge levels were identified, and the influence of work experience or prior exposure to child abuse cases was limited. This highlights that good knowledge in this area requires the ability to recognize and interpret the wide spectrum of manifestations of child abuse and neglect.

We did not find evidence that prior training effectively increased knowledge levels. However, we hypothesize that a well-designed, standardized training program focusing on recognizing both clear and subtle indicators of abuse could bridge this gap,

especially given prior studies that demonstrated the positive effects of training. Such training could also address the complex mimickers of abuse, which are often mistaken for signs of maltreatment, hereby reducing the risk of misidentification and false accusations.

Given the limitations of this study's case-based assessment and its relatively small sample, future research should aim for larger, more diverse populations to validate and expand upon these findings. Exploring the factors that influence teachers' knowledge and their understanding of how to report concerns could lead to more effective interventions ultimately providing educators and other professionals working with children with the skills needed to accurately detect and report cases of child abuse and neglect and finally strengthening child protection and welfare.

The authors have no conflicts of interest to declare with regard to the topic discussed in this manuscript.

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