J Public Health (2017) 25:155–159
DOI 10.1007/s10389-016-0772-1

ORIGINAL ARTICLE

Forensic expertise and child abuse: a survey among preventive child healthcare workers in Amsterdam, the Netherlands

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Received: 12 January 2016 / Accepted: 30 October 2016 / Published online: 14 November 2016

Abstract
Aim In the Netherlands, preventive child healthcare workers (PCHWs) have an important role in identifying signs of abuse, because they reach virtually all children. A closer cooperation of PCHWs and forensic physicians could improve the detection of child abuse. The aim of the study was to evaluate the use of forensic expertise by PCHWs.
Subjects and methods In November 2013, a survey was distributed among PCHWs employed by the Amsterdam Public Health Service ($n = 221$).
Results Forty-nine percent of PCHWs indicated suspicions of physical abuse during the last 6 months (response rate: 43 %). In all, 89 % rated the consultation of forensic physicians as useful. In a 1-year period, only three respondents sought advice from a forensic doctor.
Conclusions Although PCHWs regularly have suspicions of physical child abuse and have a very positive attitude towards consulting a forensic physician, consultation rates are very low. More research is needed to understand barriers to consultation of forensic physicians.

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Keywords Child abuse · Injuries · Forensic physician · Preventive child health care

Introduction

Child abuse has major consequences for the development of a child's physical, psychosocial and cognitive functioning and therefore is a serious health problem (Hornor 2013; Jacobi et al. 2010). Prompt identification of child abuse thus is crucial (Hornor 2013). In the Netherlands, it is estimated that approximately 34 per 1,000 children are affected by abuse (Euser et al. 2013).

Dutch Preventive Child Healthcare (PCH) provides free basic preventive care to all children and adolescents aged 0–19 years. Next to immunizations, this includes periodic assessments of physical health and growth of the child and its cognitive and psychosocial development. PCH covers more than 95 % of the population and offers an ideal opportunity for the early detection of child abuse (Reijneveld et al. 2008).

At the Amsterdam Public Health Service, both preventive child healthcare workers (PCHWs) and forensic physicians are employed. Forensic physicians are experts in injury assessment for medico-legal purposes. In Amsterdam, annually, these physicians evaluate approximately 1,500 cases of physical abuse by order of the police, including approximately 140 minors. It is to expect that better collaboration of the two specialties (PCHW and forensic medicine) will improve the identification of cases of child abuse. This is especially important as possible signs or symptoms of child maltreatment have a broad differential diagnosis and health care personnel can feel uncomfortable to take further steps when feeling uncertain about a case (Lynne et al. 2015).

Physical signs of potential abuse can be due to a normal physiologic variant/phenomenon, they can be caused by an illness

(congenital or acquired), they can be caused by an accident or can be non-accidental. Physicians working in preventive health care have the expertise to recognize physiologic phenomena and possible diseases. Forensic physicians are trained in distinguishing between accidental and non-accidental injury. Moreover, they can judge whether the physical findings are in accordance with the explanation of causation provided by the child or caretaker.

The Dutch Royal College of Medicine recently published a 'reporting code for child abuse and domestic violence', outlining the steps that professionals are expected to take in cases of suspected abuse (KNMG 2014). Step 1 of the reporting code deals with identifying and documenting the signs of domestic violence or child abuse and all actions taken in the medical record. In step 2 of the reporting code, it is recommended to seek advice from the regional *Veilig Thuis* (Safe at Home) agency ('http://www.vooreenveiligthuis.nl/veilig-thuis) and, preferably, to consult another professional (peer consultation). The reporting code makes explicit mention of the possibility to consult an expert in injury assessment when more clarity is needed on the nature and cause of an injury. In our view, Amsterdam forensic physicians are well prepared for fulfilling this task, given their vast experience with injury assessments.

Altogether, the consultation of forensic physicians by PCHWs could lead to earlier detection of child abuse, resulting in health benefits for many children. In order to increase collaboration between forensic physicians and PCHWs, a pilot project was conducted, introducing a consulting system for PCHWs. During this pilot project, PCHWs could reach forensic physicians by phone 24 h a day, 7 days a week to discuss their observations and suspicions. It is important to note that this opportunity for consultation does not have the status of a medico-legal examination as it can be ordered by the police. The intention of the pilot project was to provide low-threshold assistance to PCHWs concerning the assessment of physical injuries in suspected child abuse, especially in unclear cases.

Against this background, a study was performed to

1. Assess how frequent child abuse was suspected by Amsterdam PCHWs
2. Evaluate the use of forensic expertise by PCHWs
3. Identify barriers in the identification of physical abuse and barriers to consulting forensic physicians
4. List possible solutions to overcome these barriers

Methods

In November 2013, 1 year after the introduction of the consulting system, a questionnaire was distributed among all PCHWs employed by the Amsterdam Public Health Service ($n = 221$). The questionnaire had been developed by a group of nine PCHWs specialized in problems concerning child abuse and three forensic physicians, using an online focus group approach (Moloney et al. 2003). The members of the focus group participated in an online discussion concerning the use or non-use of forensic consultation for a period of 1 week. The discussion was triggered by one daily statement or question posted by the moderator of the focus group. The discussion and posted comments were analysed and used as input for the construction of the questionnaire. In a last step, before distribution, the questionnaire was tested for completeness and interpretability by the members of the focus group.

The questionnaire comprised three sections and took approximately 5 minutes to fill in. Section 1 contained questions about the PCHWs' experience with cases of suspected child abuse and their familiarity with the pilot project. First, PCHWS were asked when they most recently had suspected child maltreatment of any type (neglect, physical, sexual or emotional abuse). Second, they were asked to indicate when they most recently had suspicions of physical abuse in particular and whether this suspicion was confirmed (Table 1). The following questions concerned familiarity with the pilot project and knowledge of instructions on how to consult a forensic physician. Section 2 included statements on experienced barriers in addressing child abuse and in consulting a forensic

Table 1 Child abuse as reported by Preventive Child Healthcare Workers (PCHWs)

	N	%
Most recent suspicion of child abuse (neglect, physical, sexual or emotional abuse)		
Less than 1 week ago	18	18.8
1 week < 0.5 years ago	55	57.3
0.5–1 year ago	9	9.4
More than 1 year ago	6	6.3
None	8	8.3
	96	100 %
Most recent suspicion of physical abuse		
Less than 1 week ago	10	11.4
1 week < 0.5 years ago	37	42.0
0.5–1 year ago	14	15.9
More than 1 year ago	18	20.5
None	9	10.2
	88	100 %
Physical abuse confirmed		
Yes	25	31.6
No	14	17.7
Don't know	40	50.6
	79	100 %

doctor (rated 'always', 'often', 'sometimes', 'never') and potential solutions (rated 'valuable', 'not valuable'; see Table 2). Section 3 included demographic questions (age, gender) and questions on prior training on injury assessment.

Data analysis

Descriptive statistics included frequencies for categorical variables and, depending on the distribution, means and medians for continuous variables. For ease of presentation, four-point rating scale data were recoded, with 'always' and 'often' into one category and 'sometimes' and 'never' into another (Table 2).

Results

The response rate was 43 % (96 out of 221) with 65 % of respondents being nurses and 35 % doctors. The nurse/doctor ratio among respondents (65 %/35 %) was a good approximation of the nurse/doctor ratio in the population invited to participate in the survey (59 %/41 %). The mean age was 42.7 years (SD 12.2). Respondents worked 13.8 years in PCH (median; IQR: 4–24) and made 28 working hours per week on average (median; IQR 24–32), involving 10.7 children per day (median; IQR 8–13). In all, 55.2 % predominantly cared for children under the age of four (5–12 year olds: 20.6 %, 13–18 years old: 24.2 %), while 67.7 % had received some form of training in injury assessment during the last year. There were no significant differences between doctors and nurses with regard to these variables, nor were there significant differences concerning the suspicion of child abuse in general or physical child abuse in particular.

In all, 18.8 % reported suspicions of child abuse (mental, sexual, physical) during the last week and 76.1 % during the last 6 months (Table 1). With regard to physical abuse, 10.4 % had suspicions during the last week, and 48.9 % during the last 6 months, while approximately half of these suspicions remained unclarified (50.6 %).

In section 2 of the questionnaire, respondents indicated on a 5-point scale how useful they considered discussing their suspicions with a forensic physician—according to 88.6 %,

Table 2 Experienced barriers and suggestions for improvement concerning detection of physical child abuse and consultation of a forensic physician

	N	%
Detection of child abuse: experienced barriers		
Unclear signs	47	49.5
I hardly see children undressed	38	40.4
Children are absent on follow-up	28	31.1
Lack of experience	25	26.0
Lack of knowledge concerning injuries	17	17.7
Lack of interviewing skills	10	10.6
Consultation of forensic physicians: experienced barriers		
High workload	38	44.2
Organizational barriers	22	24.7
Unclear instructions concerning the documentation of injuries	21	23.3
Loss of relationship of trust towards parents/caretakers	19	20.9
Loyalty of the child towards the perpetrator	16	18.0
Loss of relationship of trust towards the child	8	8.8
Detection of child abuse: suggestions for improvement ('It is valuable to…')		
Provide additional training in injury assessment	91	95.8
Provide additional training in interviewing skills	89	92.7
Regularly undress children for a complete examination	71	74.7
Organize PCH consultations with forensic physician present	50	54.3
Consultation of forensic physicians: suggestions for improvement ('It is valuable to…')		
Regularly remind PHCW of possibility to consult a forensic physician	93	98.9
Continue the pilot	91	96.8
Get to know the forensic physicians in person	87	93.5
Improve the availability of forensic physicians	77	87.5

this was valuable (54.2 % 'very valuable', 34.4 % 'quite valuable'); 9.4 % answered 'neutral'; 2.1 % 'quite invaluable'; and nobody deemed this possibility 'very invaluable' (not in table). 76 % of respondents knew that the pilot project was running, and 44.4 % of them were familiar with the written instructions, but only three respondents indicated to have sought advice from a forensic physician in the past 12 months (not in table).

Finally, barriers in the detection of child abuse in general and barriers to consulting a forensic doctor were assessed (Table 2). 'Unclear signs' were the most important barrier in the detection of child abuse (49.5 %), while the second major barrier was that children hardly ever were examined undressed (40.4 %). Regarding the consultation of forensic physicians, a high workload of PCHWs was the most prominent barrier (44.2 %), followed by organizational barriers (24.7 %). Almost all respondents embraced the suggestion to provide additional training in injury assessment (95.8 %) and interviewing skills (92.7 %). Moreover, almost everyone found it valuable to regularly remind PHCW of the possibility to consult a forensic physician (98.9 %) and suggested continuing the pilot project (96.8 %).

Discussion

PCHWs regularly have suspicions of child abuse with 49 % of PCHWs indicating suspicions of physical abuse during the last 6 months. Moreover, PCHWs have a very positive attitude towards consulting a forensic physician as 89 % rated the consultation of forensic physicians as useful and 97 % considered it valuable to continue the pilot project. Research among Amsterdam general practitioners (GPs) also demonstrated a very favourable attitude towards forensic consultation (Ceelen et al. 2010). In the GP study, however, only attitudes and intention to consult a forensic physician were assessed, but not the actual consultation behaviour. The current study adds to this research, as consultation behaviour was studied as an outcome measure.

The pilot project was designed to provide low-threshold assistance to PCHW in the assessment of injuries and was developed to address cases falling into the 'grey area'. This study confirms that this grey area is considerable: PCHWs reported 'unclear signs' as the leading barrier to the detection of child abuse. In addition, a lack of confidence in handling suspicious cases was reported: 26 % indicated a lack of experience, 17 % a lack of knowledge concerning injuries and 11 % a lack of interviewing skills, which considering, one would expect high consultation rates of forensic physicians by PCHWs. As a matter of fact, however, only three respondents had consulted a forensic physician in a 12-month period.

How can these low consultation rates be explained? When looking at the main barriers to consulting a forensic physician, a high workload and organizational thresholds were identified as difficulties by 44 and 25 %, respectively. Other possible explanations might be the reluctance of the PCHW to believe that parents could be guilty of hurting their child (Newton and Vandeven 2009). In addition, the 12-month evaluation period might have been too short to demonstrate effects on consultation behaviour as PCHWs have not gathered sufficient experience with consulting forensic physicians. Although only 25 % indicated that organizational barriers limited the consultation of forensic physicians, 88 % suggested improving the availability of forensic physicians. This is surprising, as the telephone number communicated in the written instructions was available 24/7. However, only 44 % were familiar with the written instructions which may have led to the perception that forensic physicians were difficult to reach. Especially when the workload is high, quick access to the right number is essential. If the pilot study is to be continued, particular attention must be paid to this aspect.

The study also demonstrates that the need for training of the PCHW in handling potential child abuse remains high, even in a well-trained population. Although 68 % of the respondents had received training in the assessment of injuries during the last 12 months, almost all respondents found it valuable to provide additional training in injury assessment and interviewing skills. With respect to barriers to the identification of physical abuse, many respondents experienced it as a difficulty that children were not asked to undress for examination (40 %). A large group (75 %) considered it valuable to examine children undressed. The majority of visible injuries due to abuse are present on body locations that are covered by clothes (Reijnders et al. 2006). Examining the child undressed thus could enhance the chance to detect relevant injuries. According to current policies of PCH, children are not systematically undressed for examination, since this is considered a time-consuming intervention. In our view, this policy should be reconsidered. In emergency rooms, efforts have been made to screen children to identify those requiring further assessment for possible physical abuse (Woodman et al. 2010). Similar strategies could be applied to identify those children who should be examined undressed by PCHWs.

Consulting a forensic physician from the same organisation is one of the possible actions the PCHW might want to take in order to gain more certainty at an early stage; however, this consultation would only be meaningful if the consulted forensic physician has sufficient experience in injury assessment. The Public Health Service Amsterdam is one of the largest public health services in the Netherlands and is renowned for its expertise in the forensic medical field. The current study was performed in this local context. It is possible that the level of expertise of forensic physicians working in other parts of the country is lower, rendering a different approach necessary.

Limitations

To begin with, this study was performed to study predictors for consultation of forensic physicians by PCHWs. Due to the low actual consultation rates, interferential statistics could not be applied. Another limitation of our study was that respondents may have had more interest than non-respondents in abuse-related matters, and may therefore have been more likely to report suspicions of abuse. Also, it cannot be ruled out that the same case is remembered by more than one respondent. The reported percentages of suspected abuse therefore should be interpreted with care. Lastly, we were unable to assess whether respondents were representative for the whole population of PCHWs in terms of background characteristics.

Conclusion

PCHWs may be the first professionals in a position to begin the evaluation for possible child abuse as PCH covers 95 % of all children. Although PCHWs were very positive about the pilot project, the actual consultation rates of forensic physicians were low. More research is needed into the determinants of consultation behaviour of PCHWs in order to inform training programmes (Grimshaw et al. 2001). In addition, conditions should be created that allow PCHWs to examine children undressed to improve detection rates of physical abuse.

Acknowledgements This study was supported by institutional funds provided by the Amsterdam Public Health Service.

Compliance with ethical standards

Conflicts of interest The authors certify that there is no actual or potential conflict of interest in relation to this article.

Ethical statement I testify on behalf of all co-authors that the present manuscript has not been published in whole or in part elsewhere, is not currently being considered for publication in another journal, and that all authors were personally and actively involved in substantive work leading to the manuscript, and will hold themselves jointly and individually responsible for its content.

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