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## **ABSTRACT**

When suspicions of physical abuse arise, children are referred for a child protection medical evaluation, which occurs in a variety of health settings by a variety of clinicians. This comparative vignette survey was performed among a cross-section of medical professionals engaged in child protection in Sweden, Ireland, the UK and The Netherlands between April and July 2016. Three vignettes describing different probabilities of physical abuse were included. Components of child protection medical evaluations across the four countries were analysed.

A total of 236 physicians responded (113 UK, 49 Netherlands, 39 Sweden, 35 Ireland). Of these 61.4 per cent were female (more females in UK and Netherlands). More variation in practice than similarities was found. Similarities: experience level, confidence level, management approach (vignettes 1 and 3). Cross Country Differences: decision to investigate, adherence to National Guidelines, experience versus specialism and subsequent management post-assessment. These findings suggest the need for further exploration of practice between countries including specific and regular training, availability of support for non-specialists and use of national and international clinical guidelines to promote best practice and reduce variation. More consideration of the human and financial cost to the healthcare system of unnecessary investigations and length of hospital admission may be warranted.

## **KEY PRACTITIONER MESSAGES**

- There is a lack of uniformity in the clinical managements of physical abuse between these four European countries.
- Specific and regular training included in professional development plans and discussed at appraisal will promote clinician confidence in assessments.

- Expert support should be easily available to non-specialists undertaking these assessments.
- National and local clinical guidelines are important tools in promoting best practice and reducing variation across and within countries.

**KEY WORDS**

physical abuse; children; comparative survey; medical assessment; Europe

## INTRODUCTION

When suspicions of physical abuse arise, children are referred for a child protection medical evaluation, which may take place in a variety of health care settings. Across Europe settings include emergency departments, the Barnahus, and in-patient or dedicated outpatient clinics. The American Academy of Pediatrics and Royal College of Paediatrics and Child Health UK have published practice recommendations for the evaluation of physical abuse (Royal College of Paediatrics and Child Health, 2013), based on literature review and expert opinion (Core Info; see <http://www.core-info.cardiff.ac.uk>). However, because no 'gold standard' diagnostic tests exist, diagnosing physical abuse can be difficult [PUBLISHER – THE PRECEDING UNDERLINED WORDS ARE FOR THE MARGIN]. Decisions are made after piecing a 'jigsaw' of information together (Royal College of Paediatrics and Child Health, 2013) and coming to a conclusion based upon a balance of probability of child abuse. Uncertainty often remains (Moles and Asnes, 2014; Chaiyachati *et al.*, 2016), which may lead to practice variation and adverse outcomes for families.

Many studies report considerable variability between clinician assessments of suspected physical abuse (Christian *et al.*, 2015). Addressing this Campbell *et al.* (2015) have developed consensus guidelines (through a modified Delphi method) for initial evaluation of three common presentations of child physical abuse.

Vignette case studies provide the opportunity to assess variations in clinical judgement and decision-making amongst a group of participants [PUBLISHER – THE PRECEDING UNDERLINED WORDS ARE FOR THE MARGIN]. Providing useful measures regarding the attitudes to scenarios using identical circumstances (Font, 2013), vignettes are a good option to support investigation of delicate topics in an experimentally controlled way (Aguinis and Bradley, 2014).

Vignette studies have explored two aspects of decision making namely variability in determining the probability of maltreatment and secondly variation in the level of

investigations and interpretation of results. A vignette case study of US paediatricians found great variability in their level of child abuse suspicion, related to personal experiences and beliefs (Flaherty *et al.*, 2006). A recent study among physicians and nurse practitioners in a tertiary care paediatric emergency department, used simulation of physical child abuse scenarios (Anderst *et al.*, 2016). The authors found that 39% of participants made an incorrect diagnosis and only 30% ordered all appropriate investigations for occult injury (Anderst *et al.*, 2016). In another study of child protection specialist paediatricians, broad variability was found in the perceived likelihood of physical abuse (Lindberg *et al.*, 2008). Several clinical studies from the USA reported considerable variation in the diagnostic investigations used (including skeletal surveys, neuroimaging and blood investigations) and in the identification of child abuse, even after adjusting for individual patient characteristics (Wood *et al.*, 2012; Lindberg *et al.*, 2015; Harper *et al.*, 2016). Other studies examined physicians' attitudes and willingness to report child abuse and neglect. Swedish researchers found differences in the willingness to report suspected child abuse between physicians. The main reason for not reporting was a lack of confidence in child protective services (Borres and Hägg, 2007). Another study found that US primary care doctors infrequently reported injuries with a likely suspected child abuse aetiology (Jones *et al.*, 2008). Factors impacting the decision to report included familiarity with the family, elements of the history, use of available resources and experiences with child protective services (Jones *et al.*, 2008).

International comparisons have shown that child protection policies differ between countries [PUBLISHER – THE PRECEDING UNDERLINED WORDS ARE FOR THE MARGIN]

(Gilbert *et al.*, 2012). A vignette study among child welfare workers from England, Norway and the USA found differences in child abuse risk assessments between and within countries (Križ and Skivenes, 2013). A recent vignette study about decision-making by child welfare practitioners in Israel, The Netherlands, Northern Ireland and Spain found significant

differences between countries on most measurements (Benbenishty *et al.*, 2015). However, international comparison studies focusing on child protection medical assessments are lacking.

In this study, we have analysed components of child protection medical evaluations by physicians from Sweden, Ireland, the UK and The Netherlands. While there are some similarities, substantial differences exist in the health, social care, legal and regulatory systems and ethical approvals of each country. Sweden has longstanding legislation that mandates reporting of any suspicions of child maltreatment by all professionals working with children (Sveriges Riksdag, 2001). Reports should be submitted to the local municipal child protective services (CPS), which investigates all cases of suspected child physical abuse (Socialstyrelsen, 2014). Criminal investigators and CPS coordinate investigations through multidisciplinary teams at regional Children's Advocacy Centres (Barnahus). However, health professionals do not have a central role on these teams (Johansson *et al.*, 2017).

In Ireland professionals have a responsibility to share their concerns or seek advice, cooperate and contribute to decision-making. Legislation to enable mandatory reporting was enacted on 19 November 2015 but has not yet fully commenced. 'Mandated persons' are obliged to report child protection and welfare concerns to the Child Protection and Family Agency according to the Children First Act 2015 (Tusla Child and Family Agency, 2015). Reported concerns are followed up by Hospital or Tusla social workers.

The UK has nation specific legislation (Children and Families Act 2014 c 6) pertaining to children but no mandatory reporting of child maltreatment with the exception of Female Genital Mutilation under the age of 18 years (Female Genital Mutilation Act 2003 c 31). Professionals have a responsibility to keep children safe and have a role in identifying concerns, sharing information and taking action. Medical assessments are usually conducted

by Community Paediatricians at the request of Social Care Services or other agencies. All paediatricians are required to undertake training in child protection, varying from levels 1-6 dependent on their level of involvement in child protection.

The Netherlands has no mandatory reporting of child maltreatment, but professionals working with children and families are obliged to follow a reporting code if they suspect abuse. The code sets out steps to be followed including seeking advice from CPS. The latter can be done anonymously. Professionals can provide help and support for families without reporting the child's name to CPS. Advice requests and reports should be addressed to the 'Safe Home'; a non-judicial organisation that investigates child maltreatment suspicions and refers to support (Rijksoverheid, 2013). Paediatricians perform child maltreatment assessments; often paediatricians with a special interest who work in tertiary care centres.

This study aims to assess whether significant differences or similarities exist in child protection medical assessments for physical abuse between: 1) the four countries; 2) the professionals involved; 3) the clinicians' confidence in child protection and the influence of experience and specialism; and 4) the use of guidelines/clinical standards for assessment of suspected maltreatment. Exploring practice variability in this way is a potential first step towards improving or standardising the medical evaluation of suspected physical abuse.

## **METHODS**

### Study design

A comparative vignette survey was performed among a cross-section of medical professionals engaged in child protection in Sweden, Ireland, the UK and The Netherlands

[PUBLISHER – THE PRECEDING UNDERLINED WORDS ARE FOR THE MARGIN].

### Survey

Euro-CAN (European Epidemiology of Child Abuse and Neglect) members first developed objectives and questions included in the survey. Subsequently, 27 medical professionals experienced in child maltreatment were consulted on the survey (without vignettes). Six vignettes were developed from case material and the modified survey was pilot-tested through SurveyMonkey® for face-validity among the authors of the study, with improvements made based on pilot results.

Common denominators that satisfied every country were not expected because some question/answer categories were not equally applicable or relevant to the four European countries.

#### Vignettes

The survey included three clinical vignettes, describing cases with different probabilities of physical abuse [PUBLISHER – THE PRECEDING UNDERLINED WORDS ARE FOR THE MARGIN].

The first vignette was modelled on a case with a high probability of physical abuse (torn labial frenulum of a 10-week-old) (see Supplementary Table S1 in the online Supporting Information), the second vignette had a low probability of physical abuse (two-year-old with a femoral fracture) (see Supplementary Table S2 in the online Supporting Information) and the third vignette was modelled upon a case with concerns about physical abuse but the outcome was indeterminate (two-year-old with an ear bruise) (see Supplementary Table S3 in the online Supporting Information).

The survey was produced using the English language (see Appendix 1 in the online Supporting Information). It was mostly comprised of closed-ended questions and allocated themed open-ended questions. Each vignette asked about: level of agreement of child protection concern (5 item scale: strongly disagree to strongly agree); confidence in answering (5 item scale: very uncertain to very confident); if and when physician would undertake a child protection assessment (immediately, within 72 hours, the following week,



the following month, never); which investigations or assessments they would do (open answer); if there are any investigations they are unable to do (open answer); and management at this stage (list of choices plus open answer). Demographic data collected included age, gender, profession, work settings, year of graduation, years of experience in child protection, frequency of involvement in assessing child abuse, use of local or national clinical guidelines or standard protocols when assessing child maltreatment.

#### Distribution of the survey

Convenience sampling method for a survey distribution was employed [PUBLISHER – THE PRECEDING UNDERLINED WORDS ARE FOR THE MARGIN]. Due to crossovers in the professional bodies' distribution lists, the actual denominator cannot be determined. An email invitation (see Appendix 2 in the online Supporting Information) to participate in the online survey was distributed to healthcare workers (paediatricians, child protection community paediatricians, forensic doctors, accident and emergency doctors, general practitioners) from the four European countries. Requests to participate were sent by the Royal College of Paediatrics and Child Health UK, the Faculty of Paediatrics (RCPI) in Ireland, the Swedish Paediatric Society in Sweden, the National Center of Expertise on Child Abuse (LECK), The Scientific Education on Child Abuse to Paediatricians (WOKK) and The Dutch Organisation for Paediatric Surgeons (NVKC) in the Netherlands. Participants were informed through a brief description of the study with the approximate time to complete the questionnaire. Participation was anonymous and voluntary. Recruitment began on 25 April 2016 and was closed on 8 July 2016.

#### Statistical analyses

Descriptive statistics were used to characterise respondents' demographics. Statistical analysis for the vignette study was performed using SPSS, software Version 20 and R version

3.3.2. The chi-square test and Fisher's exact test were used as appropriate to assess associations between categorical variables. In all analyses,  $p < 0.05$  was considered statistically significant.

## RESULTS

The demographics of respondents are presented in Table 1.

The total number of respondents was 236 across the four countries [PUBLISHER – THE PRECEDING UNDERLINED WORDS ARE FOR THE MARGIN]. There were 113 respondents from the UK, 49 from the Netherlands, 39 from Sweden and 35 from Ireland. The majority of respondents were female 145 (61.4%). There was a significant variation in gender distribution across countries. The Netherlands and UK had a greater proportion of female respondents than either Ireland or Sweden. The majority of the respondents were between 40 to 69 years old (186 = 79.1%). Sweden had a significantly greater proportion of older participants than the other participating countries. The majority of respondents were general paediatricians in training (47%), followed by paediatricians specializing in child abuse and neglect (CAN, 35.6%). There were significant differences between the four countries in the professional specialities, with a greater proportion of general paediatricians than specialists or CAN doctors responding in Sweden and Ireland.

Of all respondents, 44.1 per cent had between 11 and 20 years of experience in assessing children with suspected physical abuse. Specialists were significantly different from generalists ( $p < 0.001$ ) and from other doctors ( $p < 0.001$ ) regarding the frequency of physical abuse seen, with specialists seeing cases more regularly. Overall a little over a third of specialist paediatricians/CAN doctors (34.4%) saw physical abuse cases at a rate of one or more cases per week. This contrasted with general paediatricians, the majority of whom (54.1%) saw a case monthly or annually. Those who had the least experience in child

protection work (0-5 years) saw significantly fewer physical abuse cases per year than those with more experience. The UK and Netherlands saw higher numbers of cases per year than Sweden and Ireland.

Sweden reported the lowest percentage for the use of national clinical guidelines (7.7%) compared with 54.9 per cent in the UK. Approximately one third of respondents from the Netherlands (34.7%) and Ireland (34.3%) reported using national guidelines.

Vignette 1 (10 week old with bleeding from mouth) (*high likelihood of abuse*)

(Supplementary Tables S2 a,b,c,d,e in the online Supporting Information)

A total of 150 (63.6%) of the 236 respondents strongly agreed this was a child protection concern. Of the four countries, Swedish respondents had a significantly lower proportion ( $p < 0.05$ ) of respondents agreeing or strongly agreeing (66% as opposed to 90% or more of respondents from the other three countries).

There were significant differences between the professional groups' agreement with having a child protection concern, with specialists/CAN doctors much more likely to identify concerns compared with general paediatricians ( $p < 0.005$ ).

The groups did not differ on decisions regarding the optimal timing of the child protection assessment with the majority opting for immediate assessment. Of the most experienced group, 9.8 per cent would not take this action, choosing to either proceed within 72 hours (5.9%), or wait until some other unspecified time (3.9%).

The decision to proceed to investigations varied across the four countries (Figure 1). The UK differed very significantly from the Netherlands and Sweden undertaking more radiological and biochemical investigations. Both Ireland and the UK were significantly different from the others being much more likely to conduct haematology investigations. No differences were found of significance in the other data items.

Most respondents would admit the child to hospital and carry out investigations [PUBLISHER

– THE PRECEDING UNDERLINED WORDS ARE FOR THE MARGIN] (n=192; 83.4%), refer to

Social or Child Protective Services (n=147; 62.3%) and to the Police (n=143; 60.1%).

Subsequent management of the case differed across the four countries with the UK and Ireland having a more similar practice (referring to social services and to the police, liaising with primary care for further support) compared with Sweden and the Netherlands (see Supplementary Table S2e in the online Supporting Information).

Vignette 2 (2 year old with a femur fracture) (*low probability of Physical Abuse*)

(Supplementary Tables S3 a,b,c,d,e in the online Supporting Information)

The majority, 72.9 per cent (172/236), of respondents whether separated by country, professional group or level of experience, were either undecided (70/236) or disagreed (85/236) that there was a child protection concern in this vignette [PUBLISHER – THE PRECEDING UNDERLINED WORDS ARE FOR THE MARGIN, i.e. The majority... were either undecided or disagreed that there was a child protection concern in... vignette [2]’]. There were no significant disagreements within any of these subgroups. While the UK was significantly more confident in this decision compared with Sweden and the Netherlands ( $p < 0.05$ ), there were no significance differences in confidence levels by profession or experience level.

The UK differed from the three other countries with fewer respondents (47.6%) proceeding to an immediate medical assessment (differing significantly from the Netherlands, 65.2%,  $p < 0.05$ ). Most professional groups would also proceed to an immediate assessment.

Radiological investigation was the most commonly carried out test with the UK differing significantly from Sweden ( $p < 0.05$ ) in being the least likely (56.6%) to do so. The Netherlands was least likely to do other investigations differing very significantly from Sweden and

Ireland (Figure 2) and very significantly from the UK and Ireland (Figure 2). No significant differences were demonstrated for the other data items.

Respondents in Ireland were more inclined to admit the child to hospital to carry out further investigations, practice near significance compared with the UK (51.4% vs 36.7%  $p < 0.1$ ). Of the four countries, the UK was the least likely to refer this case to social care or child protective services. Those with the least experience (0-5 years) differed from the 6-10 year group in being more likely to refer to social/child protective services. As part of their management of the case, respondents in the UK and Ireland were more likely to liaise with the primary healthcare team for further support; Ireland differing significantly from the Netherlands ( $p < 0.05$ ) and Sweden ( $p < 0.0005$ ) and the UK differing significantly from Sweden ( $p < 0.005$ ).

Vignette 3. (2 year old with an ear bruise) (*Indeterminate case*)

(Supplementary Tables S4 a,b,c,d,e in the online Supporting Information)

The majority of respondents ranged from undecided to strongly agreed with the greatest proportion, 50.8 per cent (120/236), agreeing that there was a child protection concern, with the UK having the highest percentage of undecided (26%) as compared with the other three countries. The UK was significantly different from the Netherlands and Ireland ( $p < 0.05$  for both). There were no significant differences according to profession or length of experience nor did this impact the level of confidence.

There was a tendency for respondents from the UK to proceed with an immediate assessment, more readily than Sweden ( $p < 0.1$  near significance). However, regardless of experience duration or profession, most respondents opted for an immediate assessment (71.2% of the total group).

Figure 3 compares the investigation practices by country. Respondents from the UK were significantly less likely to carry out radiological investigations, compared with the other countries ( $p < 0.0005$ ). Dutch respondents (26.5%) were the least likely to perform haematological investigations, differing significantly from the other three countries ( $p < 0.0005$ ) with Irish respondents being the most likely to conduct these investigations (74.3%). Irish respondents differed from the others in being more likely to undertake investigations in Biochemistry (34.3%,  $p < 0.05$ ) whereas only 2 per cent in the Netherlands would do so ( $p < 0.001$ ).

The most frequent response by all countries was to manage the case by making a referral to social services/child protective services [PUBLISHER – THE PRECEDING UNDERLINED WORDS ARE FOR THE MARGIN] with a significant difference between the UK (most likely 67.3%) and the Netherlands (least likely 44.9%) of the 4 countries ( $p < 0.01$ ). Ireland and the Netherlands also differed from Sweden and the UK with only 1 respondent in each country stating that they would refer to the police (Ireland/UK  $p < 0.05$  and Netherlands/UK  $p < 0.005$ ). Swedish respondents differed from the other countries in being less likely to liaise with primary care to offer further support (12.8%). Data did not show any significant difference in practice for the other subgroups (profession or experience).

## **DISCUSSION**

### **Cross-Country Similarities**

There were a number of similarities across the four countries studied with regard to years of experience in child protection, levels of confidence and management approach in vignettes 1 and 3.

### **Cross-Country Differences**

Across the four countries differences were found in the respondent's profession and when to proceed with investigations [PUBLISHER – THE PRECEDING UNDERLINED WORDS ARE FOR THE MARGIN]. In vignette 1, national guidelines in the UK (Royal College of Paediatrics and Child Health, 2013) would support a full investigation to exclude bleeding disorders, occult fractures and in many cases to consider the likelihood of abusive head trauma.

Recommended radiological investigations include a full skeletal survey with repeat imaging, as a single skeletal survey will miss fractures and a second radiological investigation is required. A CT head scan in children less than one year of age should be undertaken and considered in children between 12 and 24 months. Ophthalmology examination (to exclude retinal haemorrhages) should be performed within 24 hours.

While the UK and Ireland were similar in practice in vignette 1, the pattern differed in the other two vignettes, with the UK being the least likely amongst the countries, to undertake a skeletal survey in these circumstances. This would correspond to UK guidelines that would not recommend a routine skeletal survey in a two year old and where the UK respondents had a low level of concern for physical abuse as in vignette 2.

We found varying or contradictory responses from respondents within the same country. This could reflect variation in local, regional or personal practice and lack of or failure to adhere to national sets of policies to guide practice. There are no national clinical guidelines in Ireland and Sweden, although a third of paediatricians in Ireland follow the UK guidelines for child protection (*Child Protection Companion*; Royal College of Paediatrics and Child Health, 2013). In the Netherlands, there is a very general national guideline that does not include specific clinical decision guidance; most hospitals do have local clinical guidelines that are sometimes shared. Radiology guidelines for physical abuse modeled on the UK (Royal College of Radiologists and Royal College of Paediatrics and Child Health, 2008) are in use in the tertiary hospitals in Ireland. While this may support some of the similarities in

practice between the UK and Ireland in vignette 1, it does not hold true for the other two vignettes. Other factors such as length of experience, level of specialism, training and education may be more significant for awareness of pathways for medical investigation.

#### Experience versus Specialism

All professionals undertaking medical assessments in suspected physical abuse have a forensic aspect to their role albeit to varying degrees. In this study levels of experience did not seem to impact recognition of the Child Protection concern in vignette 1 [PUBLISHER – THE PRECEDING UNDERLINED WORDS ARE FOR THE MARGIN] although the least experienced had the least confidence in making this statement. Interestingly, three out of the 52 most experienced group would not look for physical abuse and 10 per cent of the same group would not do an immediate child protection assessment. These are puzzling findings and unexpected in a case with an acute injury clearly concerning for physical abuse of a young baby. One could speculate that the findings may be due to chance or possibly a misinterpretation of the vignette, as nuance may have got lost in translation for those non-native English speakers.

The greater number of older respondents from Sweden is likely to be an artefact of the recruitment process through the Swedish Paediatric Society's members list, for which retired members are not charged membership fees; and perhaps these members were also more available to respond. The median age of the Society member list is high, also reflecting a known workforce issue. The older age profile of Swedes did not however reflect a greater level of experience or specialism as general paediatricians made up the majority of respondents. This might explain why there was a relatively smaller proportion of Swedes who recognised a child protection concern in vignette 1 and were less certain about this. Two out of the three respondents who would not consider physical abuse in this case came from Sweden (one had no child protection concern and one stated sexual abuse). Possibly



this reflects a lack of training in this area resulting in professionals not being aware of the most common sentinel injuries.

In Ireland general paediatricians manage child physical abuse with very little access to expert overview. This may explain the Irish respondents lack of confidence given the likelihood of limited background training. This lack of expertise could result in under investigation because of lack of awareness of pathways or over investigation because of defensive practice and a fear of litigation (Studdert *et al.*, 2005). Defensive Medicine is a deviation from sound medical practice that is induced primarily by a threat of liability. Positive defensive practices include 'assurance behaviours' such as ordering tests, performing diagnostic procedures, and referring patients for consultation.

On the whole, UK respondents were specialist, more experienced, with a higher percentage reporting the use of national clinical guidelines compared to the other three countries. We did not specifically ask about training or education in child maltreatment. Otterman *et al.* (2017) suggest that only a small minority of represented countries in Europe have established systematic requirements for the education of physicians on child maltreatment. Others have shown the positive impact of subject specific training (Herbst *et al.*, 2014) and specialisation (Furth *et al.*, 2001) on clinical decision-making and subsequent management. Therefore, it appears that being a specialist and having accessed educational and development opportunities is more relevant to practice rather than the length of the respondent's experience [PUBLISHER – THE PRECEDING UNDERLINED WORDS ARE FOR THE MARGIN].

### **Management Post-Assessment**

While there were similarities across the four countries in the immediate response post-assessment, differences arose when it came to further management. This could reflect the wide variations in organisation of child maltreatment paediatrics in Europe as described by

Otterman *et al.* (2017). The authors stress the importance of considering the differing legislative frameworks and models of care across Europe when comparing epidemiology in child maltreatment.

We found a tendency for the UK and Ireland to refer to primary care for further support while in Sweden the respondents were less likely to do so. Paediatricians in Sweden see all infants under the age of 6 months for anything other than routine well-baby care. No referral is required. The public child health services are widespread, with over 98 per cent of the population attending. Community health nurses run these services, and anything medical, once referred to paediatrics or other sub-specialties, will remain there for further follow up.

Respondents in Ireland and the Netherlands differed from the other two countries.

Practitioners in Ireland refer to the Child and Family Agency in the expectation that this agency would refer to police (Gardaí). Paediatricians would only directly refer to the Gardaí if a child was at risk of immediate harm and requiring an emergency protection. Gardaí will usually be called to take photographs of injuries except ano-genital injuries as very few hospitals have medical photography. Also in the Netherlands, except in an acute life-threatening emergency, paediatricians do not refer to the police but refer to 'Safe Home' who may consider involving the police in certain (exceptional) situations.

Respondents in Ireland were more inclined to admit the child to hospital to carry out further investigations which may reflect difficulty accessing Social Workers outside of working / office hours. Just fewer than 40 per cent of those surveyed across the four countries would discharge the child after completing the assessment if no further concerns came to light. It is difficult to interpret what these actions might mean in terms of practice as it is possible that the decision to keep the child admitted was based on continuing medical concerns. However the financial burden to national health care systems must be acknowledged here, as over 60

per cent of respondents would not discharge the patient even where there were no concerns.

### **Limitations**

There were some limitations to this study. Since a purposive and volunteer recruitment method was used, it is possible that only those favourable to or interested in the subject completed the survey [PUBLISHER – THE PRECEDING UNDERLINED WORDS ARE FOR THE MARGIN], thus introducing participant bias. Our results are dependent on these self-selected respondents and it is not possible to tell how representative they are of practice in their country and the impact this will have on the findings. In addition, a sample size calculation was not done.

It was not feasible to determine the response rate as using specified individuals for wider distribution of the survey via professional organisations precluded an accurate means of determining the denominator as countries do not hold registers of physician's practising in child maltreatment. It is known that low response rates to physician surveys frequently hamper the generalisability of results (Asch *et al.*, 1997). Interpretation of the vignette details may have varied when the text was translated into Swedish or Dutch from the original English (as was done occasionally by individual respondents). The use of case vignettes has been shown to approximate the gold standard of standardised patient interviews in studies focussing on the process of care provided in actual clinical practice (Peabody *et al.*, 2000). While this is a strength of the current study, the limitations listed previously would suggest that these results should be interpreted with caution.

### **CONCLUSION**

We believe this is the first study in this field of research, to compare medical assessment practices across four European countries. At the lower level of evidence, there are important

findings of inconsistency between decisions about likelihood of proceeding with child maltreatment (CM) medical assessments between professions (within and between countries) and between countries [PUBLISHER – THE PRECEDING UNDERLINED WORDS ARE FOR THE MARGIN, i.e. ‘There are important findings of inconsistency between decisions about likelihood of proceeding with child maltreatment medical assessments between professions and... countries’] in the way that these assessments are conducted and by whom. The use of case vignettes to identify and consider practice is a strength of this study with over 230 respondents.

These findings point to the need for further exploration of practice between the countries, to include if specific and regular training through professional development plans is included in physician appraisal discussions, and the availability of support for non-specialists. More consideration of the human and financial cost to the healthcare system of unnecessary investigations and length of hospital stay following initial assessment may be warranted.

#### **FURTHER RESEARCH**

There is merit in undertaking in-depth research in Europe, using a mixed methods approach, on different professionals' perspectives and expectations regarding the purpose and outcome of medical assessments in CM. Future investment in this line of work with wider, more methodologically rigorous surveys, consensus-based e-Delphi studies exploring similarities and differences between the European countries is warranted.

The World Health Organization urges a strengthening of European health systems by providing training and ensuring that healthcare professionals possess skills to recognise CAN (World Health Organization, 2014). Moreover, an important World Health Organization report states that few countries regularly collect reliable information on the prevalence of CM and other Adverse Childhood Experiences (World Health Organization, 2014). In agreement with these recommendations, there is an urgent need to develop and implement

robust Standardised Data Collection tools with Minimum Datasets for CAN management in healthcare settings.

**Word count 4667**

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