THE INFLUENCE OF CONTEXTUAL (CHILD ABUSE OR ACCIDENT DIRECTED) INFORMATION ON THE INTERPRETATION OF RADIOGRAPHS OF YOUNG CHILDREN WITH A FEMUR FRACTURE

MHJ Loos[1], WM Allema[2], R Bakx[3], RD Stoel[4], RR van Rijn[5,6], WA Karst[6].

1. Emma Children's Hospital, Amsterdam UMC, University of Amsterdam, Paediatric Surgery, Meibergdreef 9, 1105 AZ Amsterdam, The Netherlands. Electronic address: m.h.loos@amc.nl.
2. Faculty of Medicine, University of Amsterdam, Meibergdreef 9, 1105 AZ Amsterdam, The Netherlands. Electronic address: w.m.allema@amc.nl.
3. Emma Children's Hospital, Amsterdam UMC, University of Amsterdam, Paediatric Surgery, Meibergdreef 9, 1105 AZ Amsterdam, The Netherlands. Electronic address: r.bakx@amc.nl.
4. Division Specialist Services and Expertise, Team Forensic Statistics, Netherlands Forensic Institute, PO Box 24044, 2490 AA The Hague, The Netherlands. Electronic address: r.stoel@nfi.minvenj.nl.
5. Emma Children's Hospital, Amsterdam UMC, University of Amsterdam, Radiology, Meibergdreef 9, 1105 AZ Amsterdam, The Netherlands;
6. Department of Forensic Medicine, Section on Forensic Paediatrics, Netherlands Forensic Institute, PO Box 24044, 2490 AA The Hague, The Netherlands. Electronic address: r.r.vanrijn@amc.nl.
7. Department of Forensic Medicine, Section on Forensic Paediatrics, Netherlands Forensic Institute, PO Box 24044, 2490 AA The Hague, The Netherlands. Electronic address: w.karst@nfi.minvenj.nl.

Aim The majority of paediatric femur fractures result from accidental trauma, however it is important to consider non-accidental trauma (NAT), especially in pre-ambulatory children. We study whether contextual information subconsciously biases conclusions of health-care professionals with respect to whether observations provide evidence for child abuse or not.

Methods An electronic survey with nine radiographs of femur shaft fractures was designed. For each case two different vignettes with contextual information were designed (non-abuse vs. abuse context). One of both vignettes was randomly assigned to the radiograph shown to the participant, followed by a question with a 5-point answer scale, which represents a verbal expression of the likelihood ratio of the fracture regarding a non-accidental versus accidental cause. Participants were staff members and residents of different specialisms of several hospitals.

Results In total 172 participants responded. There was a significant effect of influence by contextual information between the non-abuse context (mean 0.19 ± 1.3) versus the abuse context (mean 0.94 ± 1.1; $p < 0.001$); participants reported stronger evidential strength towards a non-accidental cause of the fracture when they were assigned to an abuse vignette. Experience in years of practice and current function or specialty did not protect the participant from being influenced.

Conclusions Health-care professionals are subconsciously biased by contextual information with respect to whether observations provide evidence for a non-accidental trauma or not, regardless of their expertise level or function. It is important to prevent contextual bias as much as possible with the recognition of its existence as a first step in this process.

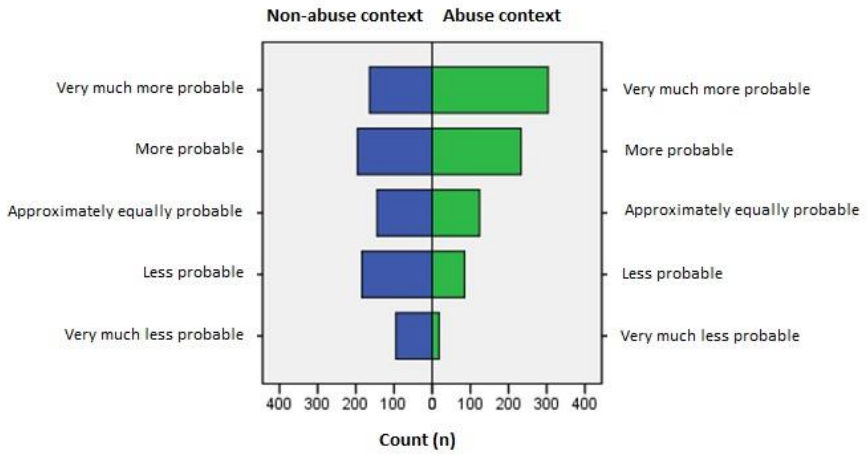

Figure 1: Provided evidential strength (total count) given by participants.