A framework for child safety and health management by analogy to occupational safety and health management

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ABSTRACT

Child accidents and diseases are characterized by many factors. Thus, a system approach to child safety and health (CSH) including different management levels is indispensable. However, the literature is scarce in holistic approach to CSH management. In this paper, a unified framework for CSH is proposed by analogy to occupational safety and health (OSH) system. In this framework, CSH management comprises decisions and actions on global, macro, and micro-levels for a safe and healthy environment for children. Global level represents international organizations working for CSH, macro level represents national regulations, and micro-level represents home environments and public places. The decisions and actions at each level are linked to the subsequent level by input/feedback relation. The framework is illustrated by hypothetical examples, and provides a holistic practical approach to CSH management. Other OSH management approaches and best practices can also be adapted to the proposed CSH system.

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1. Introduction

Child safety and health (CSH) management can be defined as a set of measures on strategic, tactical, and operational levels committed to providing and maintaining a safe and healthy environment for children. CSH is a significant public health concern until adulthood, since thousands of children die from injuries or violence worldwide, while millions of them suffer the lifelong effects of non-fatal injuries (WHO and UNICEF, 2008). Although there is no consensus on the definition of a child, we consider the definition of child in the "Convention on the Rights of the Child" as a person "under the age of 18 years" (United Nations, 1989). With this definition, it is clear that a child until the age of 18 years will be vulnerable to various hazards, and a systematic approach to the issue on different management levels is indispensable.

Although the literature is rich in child safety, most papers have a limited focus on some aspects of child safety such as child safety seats, car seat restraints, seat belt use of children, other issues in road safety including pedestrian safety and bicycle safety, falling from high chair, child abuse and maltreatment, teenage driving, seat belt use of teenagers and peer influence among teenage drivers (Abdel-Aty et al., 2007; Brixey et al., 2010; Brown et al., 2009; Chen et al., 2006; Curry et al., 2011; Eby and Kostyniuk, 1999; Goldman, 2007; Kim et al., 2009; Kiss et al., 2010; Lam, 2001; Landsman and Hartley, 2007; Lund, 2005; Mayrose and Priya, 2008; Nichols et al., 2005; Olsen et al., 2010; Rosenbloom et al., 2009; Rowling, 1999; Simons-Morton et al., 2012; Snowdon et al., 2009; Turner et al., 2005; Wagenaar, 1985; Will and Geller, 2004; Williams et al., 1997, 2007). Other topics including ergonomic considerations for child safety in public places, logistic considerations such as storage of caustic substances, and investment planning for child safety have also been discussed (Beirens et al., 2006; Roderick, 2004; Bas, 2011). Although these aspects are also crucial for CSH, they do not cover all necessary elements of CSH. In this paper, a unified approach to CSH with its several dimensions on global, macro, and micro-levels including safety culture, financial resources planning, and risk management will be considered for a thorough understanding of CSH. This systematic approach to CSH uses methodologies, and terms from OSH management. In this approach, a measure on a higher level represents input for a lower level, while outcomes on a lower level represent feedback for higher levels. The main motivation for adapting the terms and methodologies from OSH to CSH can be explained as follows: OSH management is related to management of human safety and health at work, and includes different hierarchical levels of management with different participants. Over time; terms, methodologies, standards and regulations have been defined and continuously improved nationally and internationally for a clear communication of the issue, and the companies have been guided by the governmental agencies to protect their employees during the course of their work. OSH management is basically not limited to physical work environment, and proper work design improves generally the social well-being in a country, while its lack may cause high costs for the affected employee and the company. On the other side, CSH management is management of child safety

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in different environments including home, school and playground. Like OSH, CSH management is also a national and international safety issue directly related to the national and global social well-being, and it should benefit from the well-established and continuously developed principles of OSH management.

Some efforts have been made for a child safety management framework. Some of these have been made at regional level such as municipality level for endorsing safety promoting activities such as injury registration in schools and in leisure activity settings, speed restriction, providing safe places for play in playgrounds, preschool indoors and outdoors, plans for safety education, school yard safety and swimming training (Guldbrandsson and Bremberg, 2004). Others have been more at national level, continental level or global level. As an example for a national level framework, "safe community program" is a program in China with child safety elements such as school safety with periodic controls, parent meetings, traffic control around the schools, and safety education (JianFeng et al., 2011). As a continental level framework, "Child Safety Action Plans" is a completed two-phase project of European Child Safety Alliance for "encouraging evidence-based good practices, child safety report cards and profiles based on a set of standard indicators including action indicators, child safety action plan development and mentoring process to facilitate country partners in national plan development" (European Child Safety Alliance, 2011a). TACTICS is a framework developed by European Child Safety Alliance including "benchmarking and monitoring child injury and related actions, activities for implementation of what works in child injury prevention, activities to explore multi-sectoral nature of child injury, evidence-based actions at national and regional/local levels" for "adopting, implementing, and monitoring evidence-based good practices to reduce injuries and support national child safety action plans". (European Child Safety Alliance, 2011b). "Stockholm Manifesto" is a manifesto for creating a safe environment for children in Europe by "providing better injury data, enhancing leadership and commitment to the injury issue, working co-operatively with all stakeholders" (European Child Safety Alliance, 2005). As a global level framework, "World Health Organization (WHO) safe community model" is also applicable to child safety and incorporates general requirements including age groups, environments and situations, program structure including responsibility allocation, program process including risk analyses and interventions with the participation of all levels of communities, and national/international networking (Lindqvist et al., 2002). "Safe Kids Worldwide" is a "global network of organizations to prevent unintentional child injury by parent education, research on the leading injury risks to children, evaluating solutions for identified injury risks, child safety laws and regulations, providing lifesaving devices such as child safety seats, helmets, and promoting corporate leadership in child safety through effective and sustainable partnerships" (Safe Kids Worldwide, 2013). However, none of the frameworks propose a systematic approach to CSH with its different hierarchical levels of management by showing the relations between the levels.

The structure of the paper is as follows: In Section 2, a unified framework for CSH is introduced, and the components of the framework are explained. The main components on global and macro levels are guidelines from internal organizations working for CSH, and national policy, national profile, and national program for CSH. The main components on micro-level are policy of public places such as schools, universities, leisure places for teenagers, playgrounds as well as household policy for CSH, risk assessment and development of hierarchy of preventive and protective measures (PPM), and reporting accidents and diseases. The framework and its components are basically developed by adapting several ILO conventions from Alli (2008) for OSH. In Section 3, some hypothetical examples are provided and analyzed. A hypothetical

national policy and national profile are analyzed to identify the tasks and sub-tasks in a national program. Then, a hypothetical school policy and a hypothetical nightclub policy are outlined. Moreover, three accident examples are analyzed by using fault-tree analysis to explore the root causes, which are then integrated with the hierarchy of preventive and protective measures. Engineering measures as well as organizational measures are proposed for each hierarchy level to eliminate, control or minimize the hazards and risks at source. A reporting example for each accident is also given. Finally, in Section 4, a summary of the study is given and limitations of the study, practical implications of the new framework, future research and applicability of the new framework in other domains are discussed.

2. A unified framework for child safety and health

In Fig. 1, a unified framework is proposed for CSH management. The components of the framework will be detailed next.

2.1. Guidelines from international organizations

There is a number of international organizations working for child safety and health. Some of these organizations are United Nations Children's Fund (UNICEF), The European Child Safety Alliance, International Society for Child and Adolescent Injury Prevention (ISCAIP), International Society for Prevention of Child Abuse and Neglect (ISPCAN), Safe Kids Worldwide, The Alliance for Safe Children (TASC), and The Child Accident Prevention Foundation of Southern Africa (CAPFSA) (WHO, 2013). "Convention on the Rights of the Child" is a "universally agreed set of non-negotiable standards and obligations" for "the protection of children's rights" (UNICEF, 2011). UNICEF has the global authority for children's rights, and is guided by the "provisions and principles of the Convention" (UNICEF, 2011). UNICEF issues also some reports for child injury prevention in cooperation with World Health Organization (WHO) (WHO and UNICEF, 2008), while WHO also issues some related reports (WHO, 2008). European Child Safety Alliance is an alliance of more than 30 countries across Europe working for protecting children's "rights", by "using evidence and good practice", and maintaining "solidarity" (European Child Safety Alliance, 2011c). The alliance launched a large scale project called as "Child Safety Action Plan" "whose aim is to develop government endorsed national action plans in countries in Europe" in cooperation with other organizations including UNICEF (European Child Safety Alliance, 2011a). The alliance issues reports called as "Child Safety Report Cards" including performance summary of countries across Europe and their national profiles (European Child Safety Alliance, 2011d).

2.2. National policy, national profile, and national program for child safety and health

In Fig. 2, the connection among national policy, national profile and national program is illustrated for CSH. A national policy for CSH is linked to the guidelines from international organizations, and established by considering the national profile. Then, a national program is outlined based on the elaboration of national policy and national profile. The outcomes of national program will be input for national profile, and feedback for potential improvements of national policy.

2.2.1. National policy for child safety and health

A national policy for CSH is a set of long-term strategies of a country for providing and maintaining a safe and healthy environment for children. In Fig. 3, the basic components of a national