Validation of Paediatric Fall Assessment Instrument and fall risk indicator: A Retrospective Study in a local hospital of Hong Kong

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Introduction
Paediatric patients are always considered at risk of fall. A valid and reliable fall risk assessment tool fulfilling the requirement of specificity, sensitivity, and predictive power is crucial in the prevention of paediatric fall, with consideration of nursing manpower constraint today. Currently, three assessment tools, Cummings, CHAMPS and Humpty Dumpty, are adopted in Hong Kong for the assessment of paediatric patients. In overseas studies, CHAMPS (2012) and Cummings (2010) were demonstrated to be either moderate to strong in prediction of paediatric falls; while Humpty Dumpty was indicated to be insignificant in specificity with over-sensitivity ability (2012). Although these 3 paediatric-specific tools are being in-use in Hong Kong, they were not locally validated with the confidence of fall risk prediction among hospitalized children. In view of Cummings’ high sensitivity, Pamela Youde Nethersole Hospital (PYNEH) adopted Cummings Paediatric Fall Assessment tool for some times. In order to determine Cummings’ reliability, validity and predictive value, a local study by comparing Cummings with CHAMPS was carried out. Humpty Dumpty was exempted from this study as it was not considered to be a relatively safe and cost effective tool.

Objectives
This study aims to identify an appropriate fall assessment tool to reduce paediatric patient fall by comparing the Cummings Paediatric Fall Assessment Tool (Cummings) with CHAMPS Pediatric Fall Risk Assessment Tool (CHAMPS) on their sensitivity, specificity, absolute risk reduction and fall predictive ability in hospitalized children.
Methodology
By adopting a retrospective study design, 28 fall incidences that happened in Department of Paediatric and Adolescent Medicine, PYNEH, from 2007 till 2013 were reviewed and examined. 28 non-fall paediatric patients who were admitted within the same period were selected randomly as control group. The two groups of patients were then assessed by Cummings and CHAMPS simultaneously to determine the sensitivity and specificity of the tools.

Result
A total of 56 subjects aged 9 months to 16 years old were recruited in the study. The data were analyzed by cross-tabulation using the SPSS 22 for windows. As tabled, the sensitivity of Cummings was 92.9%, while CHAMPS was 89.3%. Among the non-fall patient group, the specificity of Cummings was 60.7% while CHAMPS was only 39.3%. It indicated that Cummings was more sensitive in predicting Paediatric fall and effective in defining patient of no fall risk. About prediction ability, Cummings demonstrated better result in PPV (70.3%) and NPV (89.5%) and therefore, mastered a higher fall predictive ability than CHAMPS in both ends. Identifying paediatric fall risk together with fall prevention is our top priority of concerns in day-to-day patient care. Since Cumming is powerful in its sensitivity as well as positive predictive value, it is therefore, chosen to be the communication tool between healthcare workers within Paediatric Department of PYNEH.