

A Broad Range of Fundamental Movement Skills Assessed in Applied Settings

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Aim

This study aimed to evaluate a new combination of test items on its practical use as a tool for determining the broad spectrum of fundamental movement skills performance in six to ten year old primary school children.

Theoretical Background

All children could benefit from an instrument, which assesses the FMS. Such an instrument would provide opportunities for professionals working with young children in the context of sport and education to 1) have a more objective understanding of children's skills, 2) better meet children's developmental demands, and 3) analyse the effectiveness of their interventions. Most of the instruments focus on identifying children with FMS development disorders and are rather time-consuming. Yet, in the context of sport and physical education an instrument for measuring FMS performance that covers not only children at risk but rather a broad performance spectrum in only limited time can be of great value. We used the KTK-3 presented by Novak and colleagues (2016) however these tests are unable to provide us with the means for object control and thus it was necessary to add the eye hand coordination test developed by Faber et al (2014). Still, the KTK-3 with Faber's eye hand coordination test (i.e., the KTK-3 + EHC) to measure FMS performance needs to be evaluated for further practical use as a tool for determining the broad spectrum of FMS performance in six to ten year old primary school children. More specifically, this study was conducted to determine the effect of age and gender on the item scores, the interrelationships between the test items and the use of a motor quotient to classify into a performance category.

Research Design

For this purpose, 1121 primary school children were assessed during their regular PE class using the test items: walking backwards (WB), moving sideways (MS), jumping sideways (JS) and eye hand coordination (EHC). A modification on the original eye hand coordination protocol was introduced for the children of the third and fourth grade classes (mEHC); they were allowed to use both hands for catching. This resulted in mEHC scores for all six and seven year olds, and for some of the eight year olds. Univariate General Linear Model analyses were used to elucidate main and interaction effects of sex and age and Pearson's correlation coefficients to represent interrelationship between the raw test item outcomes. Movement quotients (i.e., MQ^{KTK-3} and $MQ^{KTK-3 + EHC}$) were converted based on the raw scores and used to classify children. Accordingly, percentage of agreement and Cohen's kappa between both classifications was determined. Alpha was set at 0.05.

Results

Significant effects for sex and age were found. Girls outperform boys on WB, boys outperform girls on (m)EHC ($P < 0.05$). On all test items children of a certain age group scored better than their 1-year younger peers, except at WB between 10 and the 8- and 9-year olds and at MS and JS between 9-year olds and 10-year olds. Moderate positive associations between the test items were found. An 80.8% agreement of classification of children was

found based on the MQ^{KTK-3} or the $MQ^{KTK-3+EHC}$. With no agreement the difference was one category.

Conclusion

The translation of the findings of the four test items into a practical tool covers different aspects of fundamental movement skill performance of six to ten year old children. It provides practitioners working with young children a reliable and valid tool that can objectively assess a broad range of fundamental movement skills within applied settings. Practitioners are advised to use age- and sex- related reference values at the m(EHC) and the WB test. There is a significant difference in fundamental movement skill performance with increasing age. Similar to the results found by our colleagues in this study girls scored higher on the WB test and on the EHC test boys outperformed girls. Finally, it needs to be acknowledged that children's development of fundamental movement skill performance is not a linear process and the variability of FMS performance is high. It is important to make use of both product and process-oriented (i.e., a focus on the quality of movement) assessment tools to provide a more comprehensive view of FMS performance. To our understanding, a comprehensive view of FMS performance can be obtained by the KTK-3 + EHC instrument and preferably in combination with more qualitative assessments made by the professional who observe children week in week out. To make the assessment process easier for practitioners we developed a web-based application to gather the data. This automation of tests also appears to be beneficial for the translation from valid applications to practical tools.

References

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