Feasibility and adherence of a playful sensorimotor training for children and adolescents during acute cancer therapy

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Purpose

Pediatric cancer patients undergoing acute medical treatment often have limitations such as balance disorders, lower extremity strength and mobility deficits, gait insecurities and a reduction in functional mobility[1]. To improve these limitations, few studies in adult cancer patients[2] as well as preliminary studies in pediatric cancer survivors[3] have already shown that sensorimotor training (SMT) seems to be a promising training method. The present study investigated the feasibility and adherence of SMT in pediatric cancer patients during acute cancer therapy using an age-specific card game.

Methods

A four-week SMT intervention is conducted in pediatric cancer patients (n=8; age 5-21). Training is performed 3x/week (every 2nd supervised) and consists of 3-6 sensorimotor exercises (for training protocol see **Figure 1**). To allow pediatric patients sufficient self-determination during acute cancer therapy, they can individually choose different intensity levels for the exercise components *positions, surfaces,* and *dual tasks* using a specific card game. Feasibility was measured by various parameters and training satisfaction was assessed applying two self-developed questionnaires.

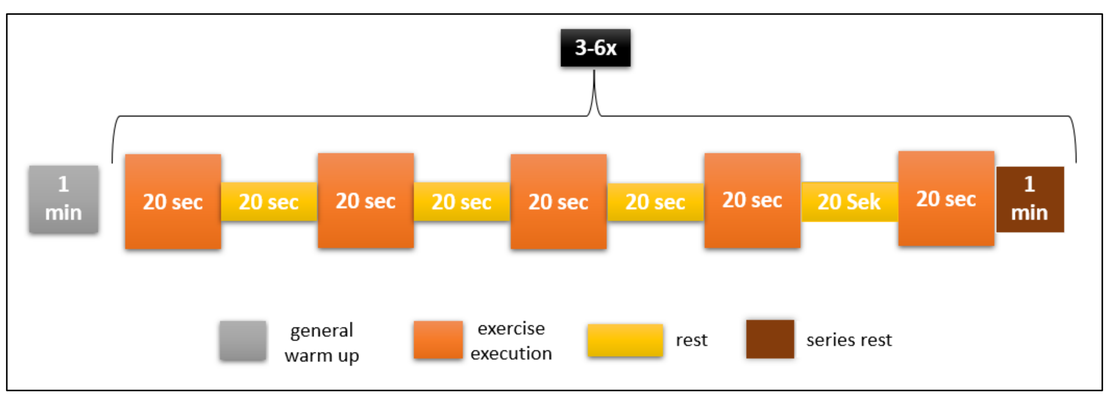

Figure 1 Schematic illustration of the training protocol

Results

Regarding feasibility of SMT, the overall participation rate was 65.63 %. Per session, patients completed an average of 3.10 ± 1.07 (md:3: min:1-max:6) sensorimotor exercise. In addition, the preferred training intensity was at level 1 (25.64 %), 2 (23.08 %) and 3 (25.64 %) of the 10-level Borg scale and the preferred chosen intensity was at level 5 (23.30 %) and 7 (22.68 %) out of possible 12 according to the chosen composition of the three exercise components (**Figure 2** and **Figure 3**). No side effects or adverse events were observed.

Results

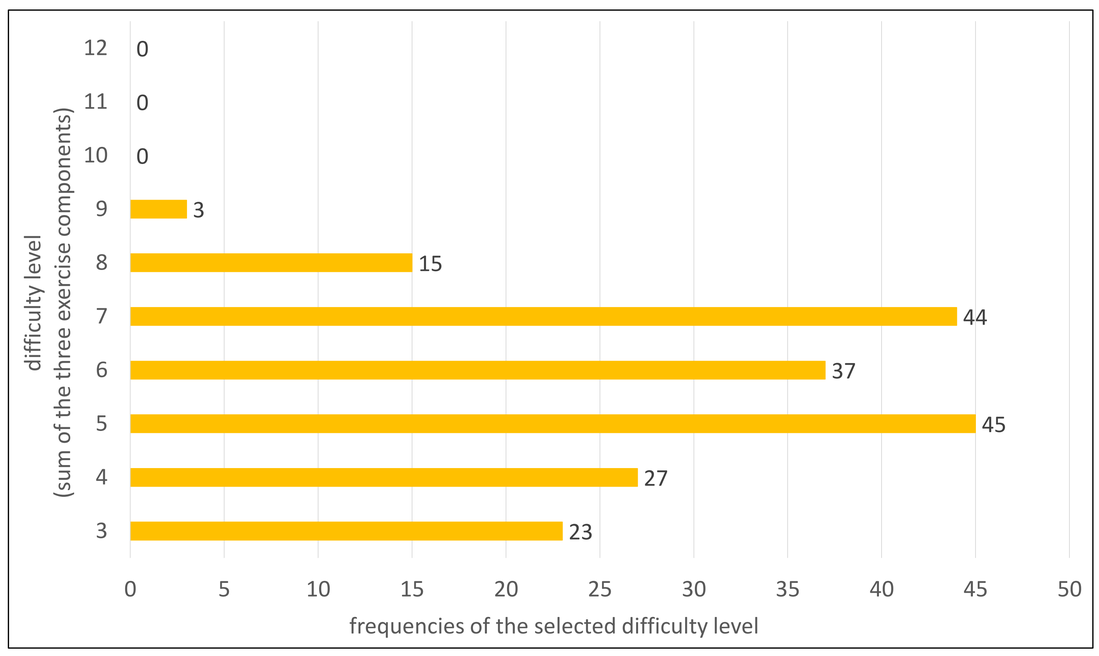

Figure 2 Choice of difficulty level

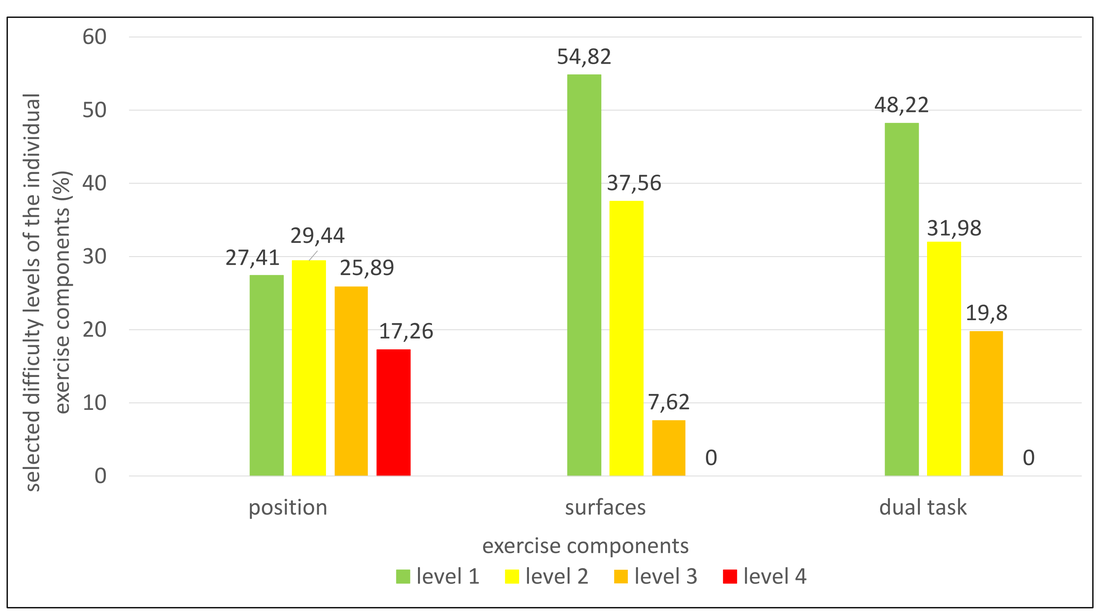

Figure 3 Composition of the exercise components

The evaluation of the questionnaires revealed a high satisfaction with the card game. Respondents reported that SMT was fun, motivating, diversified, neither too long nor exhausting, and easy to understand.

Conclusions

For children and adolescents during acute cancer therapy, the card game-based SMT can be a safe implementable method. In this regard, a playful application with a card game, adapted to individual abilities, can promote satisfaction, fun and training motivation. Future studies could expand on this by designing more practice cards. Since previous studies have not examined the effectiveness of SMT in pediatric cancer patients during acute cancer therapy, this remains to be tested in future studies.

References

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