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Impact of Touchscreen Technology on Children's Fine Motor Development

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Case

A five-year-old boy is being seen by his school occupational therapist (OT) to work on fine motor deficits which seem to be delaying his handwriting development. His mother met with the OT and informed her that she is a single parent and is often busy, so her son spends most of his time at home playing on his tablet. The OT is interested in understanding if there is a relationship between the tablet use and the client's fine motor skills.



1 Ask: Research Question

Does use of touchscreen technology impact the development of fine motor skills among children with developing grasp?

2a Acquire: Search

Databases: PubMed, Scopus, ClinicalKey, CINHAL Complete & Proquest Health and Medical

Patient/Client Group: Children developing grasp

Intervention: Touchscreen technology

Comparison: No technology

Outcome(s): Impact on fine motor skills

2b Acquire: Selected Articles

Axford, Joosten, & Harris (2018): A two-group pretest-posttest design that examined the effects of iPad applications, specifically focused on fine motor movements, on children's fine motor skills.

Moon, et al. (2018): A cross-sectional analysis that examined the relationships between smart devices and the development and language levels in young children.

Bedford, et al. (2016): A correlational study that examined how touchscreen usage changes across children 6-36 months, and toddlers 19-36 months retrospective reported age of first touchscreen usage associated with developmental milestones of gross motor, fine motor, and language.

3a Appraise: Study Quality

Axford, Joosten, & Harris (2018): Level III, n= 54. Strengths: two-group pretest-posttest, scorers blinded to treatment groups, and used reliable outcome measures. Limitations: non-randomized, convenience sample, small sample size.

Moon, et al. (2018): Level IV, n= 117. Strengths: variety of measures, excluded children with developmental disabilities, large sample. Limitations: convenience sample, parent report, limits to smart phones and tablets.

Bedford, et al. (2016): Level IV, n= 715. Strengths: large sample size, wide age range, and examined correlations among variables. Limitations: parent report, more females than males.

3b Appraise: Study Results

Axford, Joosten, & Harris (2018): Significant increase in motor coordination, within the Beery VMI, in children in the experimental group compared to the control group ($p < 0.004$). Improvements were noted in visual perception and visual motor integration, but with no statistical significance.

Moon, et al. (2018): Significant positive correlation in three-year-old children between smart device usage frequency and fine motor skills ($r = 0.462$). There was no correlation between fine motor skills in four- and five-year-olds.

Bedford, et al. (2016): Age of first touchscreen usage was significantly associated with the fine motor milestone of stacking blocks ($r = 0.16$, $p = 0.03$). The study had no negative associations between touchscreen use and developmental milestones.

4 Apply: Conclusions for Practice

Touchscreen technology may be a helpful OT intervention used to increase children's fine motor skills. If touchscreen technology is going to be used as a part of treatment, it is important to consider the applications being used. Applications that target specific fine motor movements will be the most beneficial. However, further research is needed to examine the possible causation between touchscreen technology and fine motor skills. Additionally, more studies need to be conducted that include randomization, larger sample sizes, and are longitudinal.

References

Axford, C., Joosten, A. V., & Harris, C. (2018). iPad applications that required a range of motor skills promoted motor coordination in children commencing primary school. *Australian Occupational Therapy Journal*, 65(146-155). doi:10.1111/1440-1630.12450

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Moon, J.H., Cho, S. Y., Lim, S. M., Roh, J. H., Koh, M. S., Kim, Y. J., & Nam, E. (2018). Smart device usage in early childhood is differentially associated with fine motor and language development. *ACTA Paediatrica*, 803(5253). doi:10.1111/apa.14623

Touchscreen technology is shown to be positively associated with fine motor skills in children but a greater rigor of studies is needed to show a causal relationship.

