USES OF TECHNOLOGY IN THE ASSESSMENT OF YOUTH WITH PAIN

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Introduction

Over the past two decades significant advances have been made in the assessment of pediatric pain. One important development is the integration of Electronic and Information Technology (EIT), mainly Web-based systems and mobile handheld devices. A number of advantages arise from the use of EIT in the assessment of youth with pain, namely: greater accessibility, higher level of compliance, higher response accuracy or data collection in real time, among others [1]. The aim of this review was to analyze the uses that clinicians and researchers have given to EIT when assessing youth in pain.

Method

A search of MEDLINE, CINAHL, PsycINFO, ERIC and Psychology and Behavioral Sciences Collection was conducted for published literature from 1990 to December 2011. Works included in this review were studies addressing EIT-based assessment of pain in children and adolescents and informing about psychometric properties of the devices at use. In all these works pain was self-reported by the participating children or adolescents.

Results

Studies were classified according to the device used: desktop computer, handheld computer and basic mobile phone. Most referred to hand-held devices, with electronic pain diaries or Personal Digital Assistants being the most prevailing alternatives. The analysis conducted showed that these devices have strong psychometric properties . Generally speaking, studies concluded that participating youths did not have difficulties when using these EIT-based instruments. Higher rates of compliance, preference over the traditional paper and pencil choice, and response accuracy were some of the main advantages emphasized by authors.

	Author, year	Instrument	Characteristics
Desktop computer	Calam et al., 2000 Watson et al., 2002	MacInterview (pain module)	-High face validity and high acceptability - High test-retest reliability (r= 0.9) - Moderate-to-high convergent validity (r=0.65- 0.88)
	Fanciullo et al. (2007)	Computer Face Scale (CFS)	-Good feasibility: no trouble in its use - High convergent (r_S= −0.72) and discriminant validity - 76% of children preferred the CFS
Handheld computer	Walker and Sorrells, (2002)	Electronic diary	-Easy to learn, quickly to use, and understand. Not interference with family activities. Children needed little assistance in answering the questions. - High accuracy: responses were "very accurate" or "accurate". -High level of user satisfaction. - Compliance: 100% (no missing data).
	Palermo et al. (2004)	Electronic diary	-Greater compliance with the e-diary in contrast with the p-diary (83.3% vs. 46.7%; 6.6 days vs. 3.8 days completed) - High accuracy (100% e-diary vs. 51.3% p-diary). -No differences in acceptability depending on diary format.
	Stinson et al. (2006, 2008a, 2008b)	e-Ouch Electronic Diary	- Learnability: Easy to learn, use, and understand -High accuracy, no diary entries contained errors. - High acceptability: quick/easy to remember and complete, minimal interference with activities. High satisfaction. -High compliance (70-78%; 22% of data missing) -High convergent (r=0.49-0.84) and adequate discriminant validity (r= -0.39 – 0.48) -Good sensivity to change.
	Gulur et al. (2009)	Computer Face Scale (CFS)	-Good feasibility: children were able to use the CFS - Adequate test-retest reliability (pain: r=0.77-0.80; mood: r= 0.82) - Adequate concurrent (r_S= −0.68) and discriminant validity (r=0.55) - 77% of children preferred the CFS
	Lewandowski et al. (2009)	Electronic diary	-Greater compliance with the e-diary (6.89 days completed) in contrast with p-diary (4.97 days completed)
	McClellan et al. (2009)	Daily Pain and Activity Diary (DPAD)	-High rates of participation (76%), -High daily diary completion (100% of items completed) -Parents and youth rated the diaries as easy to use.
	Wood et al. (2011)	Electronic version of the FPS-R	-High agreement (K= 0.85) and high correlation (r_s =0.91) between the paper version and the electronic version. -No mean difference between the paper version and the electronic version (3.1 ± 2.3 vs. 3.2 ± 2.3) - 87.4% of the children preferred the e-version
Mobile phone	Alfvén (2010)	SMS-pain-diary	- High construct validity (concordance of 0.77) -High test-retest reliability (K=0.73) - Compliance: 75-83% - Acceptability: easy to understand and use

Conclusions

An overview of published evidence of the uses of EIT in the assessment of youth with pain is provided. The results indicate that there has been an increasing support for the use of these EIT-based devices. Moreover, studies show that certain psychometric properties do, in fact, improve when EIT are implemented. EIT-based assessment seems a promising area, one that deserves additional attention and awaits further developments to improve the accuracy of the assessment of youths with pain.

References

[1] McGrath PJ, Watters C, Moon E. Technology in Pediatric Pain Management. In: Finley GA, McGrath PJ, Chambers CT. Bringing Pain Relief to Children: Humana Press, 2006. pp. 159-176.

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