



RESEARCH ARTICLE

I-Pad Based Psychosocial Assessment in a Pediatric IBD Clinic

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Abstract

Background: The HEEADDSS psychosocial assessment interview is recommended to determine risk and resilience among teens and pre-teens. Its inconsistent use in specialty clinics has been attributed to time constraints, and specialists' lack of familiarity with the instrument. This study explores the feasibility, and acceptability of using TickiT®, a digital version of the HEADDSS presented on a tablet (iPad®), in a busy pediatric Inflammatory Bowel Disease (IBD) Clinic. The study also presents data on risk taking behaviours and resilience factors in this population.

Methods: Sixty outpatients (mean age 14.88 +/- 1.93 years, 43% female) attending the McMaster Children's Hospital Pediatric IBD clinic completed the electronic HEADDSS assessment (TickiT®). Tabulated responses were provided to attending physicians.

Results: Fifty of the 60 participants had inactive disease at the time of the study. All of the patient approached completed the assessment and 98% of the patients found the graphic presentation of questions easy to use and understand. Ninety-three percent (93%) of the participants reported that the survey responses provided important information for the health care team. Standardized live reports highlighting resiliency and risk-taking behaviors, and emotions were generated for physician/allied health review.

Discussion: The study demonstrates the effectiveness of a digital application (TickiT®) for psychosocial screening in a pediatric IBD clinic. The ready availability of patient reports for the health care team provided a comprehensive understanding of the psychosocial status of the patient with the added benefit of identifying at risk patients in need of immediate attention.

Introduction

Overview

Children and adolescents with chronic disease, such as Inflammatory Bowel Disease (IBD), are often described as being at greater risk of psychological problems than their peers due to the nature of the condition which represents a 'non-visible' disability [1-4]. Burdens on these children can include chronic inflammation, the need to follow special diets, growth stunting/developmental delay, and the need for repeated medical appointments and intrusive procedures [5, 6].

Psychosocial assessment should be performed in youths with IBD to define elements of resilience as well as areas of concern. [7-10]. Recommended assessments usually include the topics covered in the HEEADDSS acronym (Home, Education, Eating, Activities, Drugs, Depression (including Suicidality), Sexual Health, Safety), an interview-based assessment strategy developed to support healthcare providers engage in comprehensive psychosocial screening for children and adolescents. [11, 12].

The HEEADDSS assessment was designed as a guided interview between a health care practitioner, physician or allied health, and the patient. This method's limitations include time constraints, lack of privacy if performed in the presence of the patient's guardian [13] and the stigma associated with sensitive issues. Pediatric patients often find it uncomfortable and embarrassing to discuss topics such as sexual health

and alcohol, cigarette and drug use openly with health care professionals, especially around their parents/ guardians [14].

Furthermore, if sensitive issues or risks are exposed during screening, the healthcare team may be required to address the issues resulting in the need for additional resources [15]. As the HEEADDSS interview can take 20 minutes to complete, it often isn't done in the routine clinical encounter [15].

In this study, the digital platform/ application TickiT® was used to evaluate the feasibility and acceptability of conducting electronic psychosocial screening based on the HEEADDSS assessment in the IBD clinic. This tool interface presents a child and youth friendly, low literacy, highly graphical format that has been found to be engaging, acceptable and comprehensible in young patients (aged 14-18 years) irrespective of gender and ethnicity [16] and has been positively reviewed by providers in a clinical setting [17,18]. The Pediatric Gastroenterology Department at McMaster Children's Hospital collaborated with TickiT Health (Vancouver, Canada) in adapting and incorporating this tool for use in the IBD clinics.

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Objectives

The purpose of this project is to study whether presenting an established risk assessment tool on a portable electronic tablet format has an impact on participation, the feasibility and acceptability of the screening process. A second objective was to assess risk and protective factors in a pediatric population with a chronic disease (in this study IBD) compared to the normal pediatric population data observed in the literature [19].

Methods

Study design

Sixty outpatients attending the McMaster’s Children Hospital Pediatric Inflammatory Bowel Disease Clinic were invited to participate in this study. The study received approval from the Hamilton Integrated Research Ethics Board (HIREB) prior to commencing recruitment. Patients between the ages of 8 and 17 years were approached for participation by a research coordinator at clinic registration. Upon consenting to participate, subjects were given one of two reconditioned basic electronic tablets (iPad®-Cupertino, California) imbedded with the HEEADDSS adolescent risk assessment questionnaire facilitated via the TickiT® application (Tickit Health, Vancouver, Canada). The presentation format features one screen per question, using interactive graphics at a grade 4 literacy level format (Figure 1). The “questions” are presented in the first person, (a design feature that makes the tool more engaging), are framed to be non-judgmental. Questions cover resilience themes, such as connectivity (“I have someone I can talk to about my problems”) and physical activities as well as risk issues. The questionnaire covers the following topics: sex, education, eating habits, activities, emotions, safety, drug use, health as well as impressions of the tool usability and content. Questions regarding the topic of sex and drugs were asked of subjects aged 12 years and above only. The participants completed the questionnaire independently, without the assistance of their parent or guardian, either in

the waiting room or the consult room prior to the clinic visit. Upon completion the iPad® was returned to the research coordinator. The encrypted responses were transmitted to the secure password protected data dashboard by the research coordinator, who downloaded the individual reports for each participant. Reports used a red cross to flag a critical issue, an orange triangle for an issue of concern and green tick for protective responses. Red alerts, suggesting the possibility of self-harm, were immediately communicated to the attending physician. If no alarm symptoms were identified, the reports were shared with the attending physician prior to the next clinic visit which allowed the health care team to address areas of concern or reinforce positive behaviors.

Data analysis

Aggregated questionnaire data in CSV format was automatically transcribed into Excel (Microsoft Office) and descriptive analyses of the sample population were performed.

Results

Participant Demographics

Participant demographics and details are listed in Table 1. Participants were representative of a normal IBD patient population observed being monitored in the clinic. There were 34 males (56.7%) with a median age of 15.09 ±1.78 years (age range 10-17) versus 14.62 ± 2.12 years for the girls (age range 8-17) 33 (55% had CD, 22 (36.7%) had UC, and 5 (8.3%) had undifferentiated colitis. 50 (83.3%) were in clinical remission according to PCDAI or PUCAI disease indices while 7 (11.7%) had mild disease and only 3 (5%) had moderate to severe disease.

Feasibility and acceptability

All sixty patients approached for participation agreed to complete the questionnaire and completed it independently in less than 12 minutes. The TickiT® application was found to be ‘very easy’ or ‘easy’ to use by 98% (59/60) of the participants,

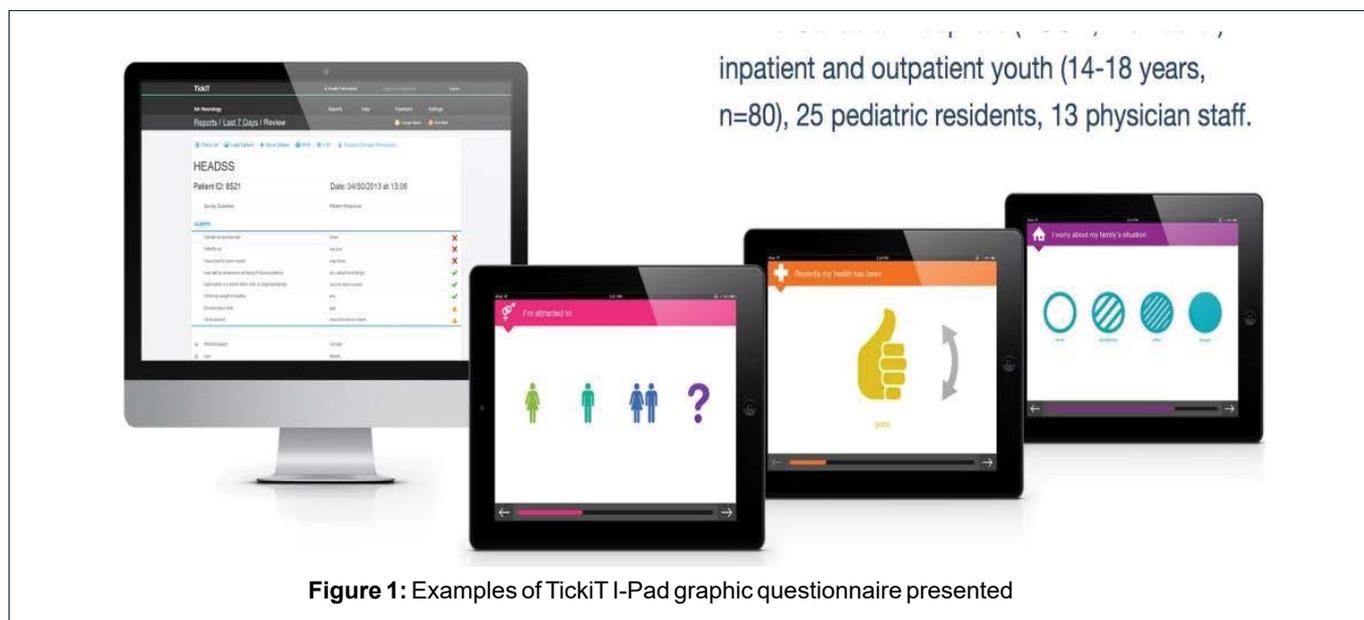


Table 1: Sample population details

	Participant Population	Female Participants	Male Participants
N, (%)	60	26 (43.33)	34 (56.67)
Median age, y	14.88 ± 1.93	14.62 ± 2.12	15.09 ± 1.78
Age range, y	8-17	8-17	10-17
IBD diagnosis (%)			
CD	33 (55)	14	19
UC	22 (36.67)	3	2
Undifferentiated colitis	5 (8.33)	9	13
Disease severity (PCDAI or PUCAI) (%)			
Clinical remission	50 (83.33)	22	28
Mild disease	7 (11.67)	2	5
Moderate/ severe disease	3 (5)	2	1

and 97% (58/60) of the participants thought the questions were ‘very easy’ and ‘easy’ to understand. (Figure 2) Ninety three percent (56/60) of the youth believed that the completion of the questionnaire was useful to the healthcare team, and 67% (40/60) of them thought that completing the survey helped them feel more prepared for their medical appointment.

Resiliency behaviors (Positive Indicators)

Participants had to choose from a list of spare/ leisure time activities. The most frequently reported leisure activities preferred are computer (n=44), friends (n=44), music (n=42), cell phone (n=41), social media (n=39) and TV (n=38), indicating that socializing and electronics predominate in this group. On average subjects spent 4.33 hours operating electronics and technology (Range: 1-14 hours, SD=2.67) a day watching TV, browsing the Internet, texting and/or playing video games. Thirty-eight of the 60 respondents reported involvement in sports teams, clubs and organized activities on a weekly basis, with 15 participating once or twice a week and 23 more than twice a week. The average amount of time spent in physical activities is 8.15 hours per week (Range: 0-40 hours, SD=8.44). Thirty-two participants reported employment, working an average of 8.1 hours per week (Range 1-30 hours, SD=7.65).

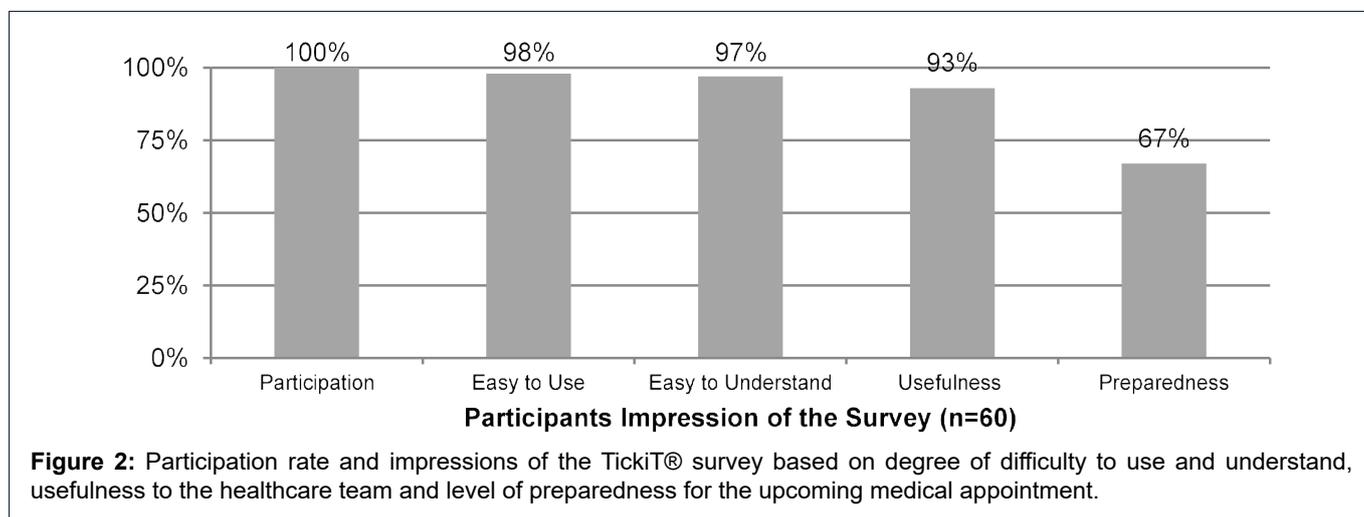
Risk behaviors (Negative Indicators)

Fourteen (14) of 60 participants admitted to leaving their home without parental/ guardian permission, with 6 participants sneaking out more than once. Twenty subjects reported never wearing a helmet while biking. Ten participants, 3 female and 7 male acknowledged sexual activity. Some used more than one method of contraception and one participant reported to not using any contraceptives. The top preferred methods of contraception were condom use (n=8), birth control (n=4), morning after pill/ plan B (n=1).

Thirteen participants of the 60 had tried marijuana, with 1 participant using marijuana more than twice a week and 5 participants using marijuana once or twice a month. Eight participants had tried smoking cigarettes (more than twice a week, n=1; once or twice a week, n=1; and once or twice a week, n=1) and 19 participants tried alcohol (once or twice a week, n=4; and once or twice a month, n=8). Of the 19 who admitted to alcohol consumption, 8 had experienced a bad hangover, 3 had “blacked out”, 1 was involved in a physical altercation and 1 participant was picked up by law enforcement officials.

Mental health

Overall, the study population reported to generally having



positive feelings regarding everyday life, 19 participants feeling 'great' and 34 feeling 'good'. However, 19 participants admitted 'sometimes' being able to handle their worries and 1 'never'.

Six participants reported previously attempted self-harm, with 2 participants 'more than once' (1 female and 1 male) and 4 'once' (2 female and 2 male). Most of these (4 of 6) attempts occurred more than 3 months prior to participation in this study.

Six participants (3 males and 3 females) reported suicidal thoughts. Two reported suicidal ideations in the prior 3 months, and the others within 3-6 months of the study. The average age of these participants was 16.5 years of age. (Range: 15-17, SD=0.71). These patients constituted those at greatest risk. While some of these patients were known to be of concern to the clinic pediatric social services team, others were only detected through this screening.

Discussion

In this study we sought to assess feasibility and acceptance of using a self-report digital format of the HEEADDSS assessment in pediatric patients with chronic disease. Psychosocial screening is a key step in the process of providing health care to young patients, especially for those with chronic conditions. Previous studies assessing participation rates in the traditional guided interview format of the HEEADDSS psychological assessment, report 50% participation rates in an inpatient setting and 19% in a surgical setting [14, 15]. Our study demonstrated very high uptake and completion rate, highlighting the benefit of using a digital format of the HEEADDSS assessment. We attribute this response to the appeal of an interactive, engaging and familiar technology, the ability to complete independently, the perceived increased confidentiality through asynchronous communication and the short duration for the completion of the assessment.

Over 90% of young individuals use technology daily, however many remain skeptical of using technology as a means for health care management [20-22]. In contrast, our study shows ready uptake for these patients as part of their health care management. The majority of participants (96%) found the tool acceptable, easy to use and understand. The study indicated it could be used in patients as young as 8 years old. Furthermore, the participants reported the tool as useful to the healthcare team in preparation for their medical appointment, suggesting positive engagement in sharing personal and sensitive information with their doctor. Finally, identifying six patients (10%) with suicidal ideation determined the tool was sensitive in picking up high risk issues.

The second objective of the study was assessing positive and risk behaviors in pediatric patients with chronic disease. Our study participants reflected the risk behavior patterns of a normal healthy pediatric population [23]. Even with a very high response rate, only subset of the patients was found to be at increased risk as described in the literature. We also compared our resilience data to that reported in the literature for healthy

adolescent populations. Our findings indicate that young individuals diagnosed with IBD show similar communication behaviors and physical activity levels to the general healthy population. The high rate of participation (63.33%) in team or individual sports (average of 8.15 hours/ week), is considered to be within the healthy ranges of physical activity for the described age range.

Study participants reported similar levels of risk taking behavior, such as binge drinking, cigarette smoking, casual sex and violent behavior comparable to a healthy population [9, 10].

Technology has changed the nature of social interaction in young individuals. Purcell and Lenhart (2010) found that 93% of young, healthy individuals use technology to access the internet daily and that 73% connected to social networking platforms. Cell phones are predominantly used to connect with friends via text messaging or calls [24, 25]. Our findings failed to indicate that technology prevents children and adolescents from having healthy physical activity levels.

In summary, the digital format of the HEEADDSS assessment allowed a more normalized and comprehensive screening of patients, with increased efficiency, accuracy and confidentiality. This comfort with technology also helped identify those at high risk and in need for extra support through disclosure of sensitive issues from at risk individuals who are often non-communicating.

Limitations

A limitation of the study is the small sample population size. A larger study is required to increase the validity of these findings. As 50 out of 60 participants were classified as being in 'clinical remission' at the time of participation, findings should not be extrapolated to patients at diagnosis or during active relapse.

While the tool was powerful in collecting behavioral data, as revealed by the patients who expressed suicidal ideation, this study was limited to the acceptability of using a digital tool outside of the context of a study. It did not capture the provider experience, nor the impact on broader aspects of clinical care.

Conclusion

While the HEEADDSS assessment interview is the recommended as essential practice, practical considerations often restrict its use in routine clinical settings. The single social worker attached to the pediatric IBD clinic at this tertiary hospital could not regularly interview all of the pediatric IBD patients routinely seen three to four times yearly. While clinic staff, nurses and residents include general psychosocial assessment in their patient interviews, time limitations prevent HEEADDSS screening and questions about recreational drug, tobacco and alcohol use and sexual activity on a consistent basis. Use of the I-Pad® HEEADDSS assessment for regular screening of pediatric patients with chronic conditions proved practical and time efficient in this busy sub-specialty clinic. It also illuminated areas in which teens could be reinforced for positive behaviours

and community involvement. Our study indicated that this technology helped to identify the patients previously not known to be at risk for needed attention. Further research needs to be done on the impact on workflow and outcomes.

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