

Feasibility and Acceptability of an iPad Application to Explore Symptom Clusters in Adolescents and Young Adults With Cancer

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Background. The aim of this study was to evaluate the feasibility and acceptability of a computer-based symptom cluster heuristics tool designed to explore symptom clusters experienced by adolescents and young adults (AYAs) with cancer. The Computerized Symptom Capture Tool (C-SCAT) is a newly developed iPad application, which combines graphical images and free text responses in an innovative heuristics approach to explore symptoms and symptom clusters. **Procedure.** Seventy-two AYAs (13–29 years of age) with cancer at five institutions across the US completed the C-SCAT 24–96 hours after the initial chemotherapy dose in a chemotherapy cycle. **Results.** All participants completed the C-SCAT successfully in a mean of 25 minutes, with 74% reporting

that the final image was an accurate or very accurate representation of their symptom experience. Little clarification/coaching was necessary while completing the C-SCAT. Few technical problems were encountered. Participants judged the C-SCAT questions to be clear and endorsed ease of following instructions, typing, and drawing. **Conclusions.** The C-SCAT demonstrated feasibility and acceptability. With refinement based on study results, the C-SCAT has potential to: (a) empower AYAs to communicate their symptom experience and partner with providers in their care; (b) improve symptom management and ameliorate distress; and (c) translate to use with other highly symptomatic populations. *Pediatr Blood Cancer*

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Key words: adolescent; cancer; mobile technology; symptom assessment; young adult

INTRODUCTION

The need for symptom management to alleviate psychological and physical distress in adolescents and young adults (AYAs) with cancer is well-recognized [1]. They experience multiple co-occurring interrelated symptoms due to disease and treatment that may have a greater complex synergistic negative impact on their health-related quality of life (HRQOL) than any single symptom. The term “symptom cluster” is commonly used to refer to two or more co-occurring, related symptoms. Symptoms that cluster may share a common underlying biological mechanism or mediator pathway, may incrementally affect patient outcomes, and may be ameliorated by a single intervention targeting the entire cluster or a key symptom within the cluster [2–8]. Thus, attention to symptom clusters, in addition to single symptoms, may promote more comprehensive assessment and effective symptom management.

Only a few published studies have examined symptom clusters in adolescents with cancer [9]. These studies have been limited by small samples or inclusion of younger children [10–13]. Similarly, research addressing symptom clusters specifically in young adults with cancer is sparse as most published studies of symptom clusters in adults with cancer have emphasized cancer diagnoses that are more common in older adults [14].

Research exploring the perspectives of AYAs with cancer of how their symptoms cluster or group together is also limited [15–17]. Symptom heuristics are defined as “mental rules that people use to interpret somatic events (and which)...give meaning to somatic changes” ([18] p. 485); while symptom *cluster* heuristics are the mental rules people use to interpret and give meaning to clusters of somatic events, or symptoms. In contrast to conventional deductive approaches that use multivariate statistical techniques such as factor or cluster analysis to identify clusters from lists of symptoms reported by cohorts of patients [5,10,11,12,19,20,21], an inductive heuristic approach focuses on an individual’s unique symptom experience. Using a heuristics approach to understand how the individual understands his/her symptom experience has potential to both inform and transform symptom management.

Advances in computer-based technology support the generation of novel tools for collection of patient-reported outcome data. Benefits of using computer-based tools for symptom reporting in a clinical oncology setting include improved communication with patients and identification of symptoms, which are under-reported and/or most bothersome [22]. The literature is mixed regarding the preferred vehicle for adolescents to report symptoms. One study found most adolescents with chronic pain preferred using computer-based diaries to paper diaries [23]; while another found the majority of adolescents with cancer-related fatigue preferred paper to computer-based symptom reports [24]. However, various electronic symptom reporting tools have been used successfully by adults [25,26] and adolescents with cancer [27,28]. Investigator-designed applications (apps) provide an avenue for novel innovative content, format, and delivery [29] ideally suited to exploring symptoms and symptom clusters. Most important with the AYA population in this era of fluid technology is to keep current and flexible with delivery devices. The aim of this study was to evaluate

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Grant sponsor: Primary Children’s Hospital, Seattle Children’s Hospital, and Children’s Mercy Hospital from St. Baldrick’s Foundation Supportive Care Grant 2011–2013.

Conflict of interest: Nothing to declare.

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Received 25 January 2014; Accepted 23 May 2014

the feasibility and acceptability of a computer-based symptom cluster heuristics tool designed to explore symptom clusters experienced by AYAs with cancer.

METHODS

Sample and Setting

Eligible participants were AYAs with cancer 13–29 years of age who were receiving myelosuppressive chemotherapy in either an inpatient or outpatient setting. Participants were recruited from five academic medical centers across the United States, representing the Pacific Northwest, Intermountain West, Midwest, and Southeast. Based on the age of the patient population served, all five sites collected data from young adults, and three of the five sites also collected data from adolescents.

As this study sought to evaluate the feasibility and acceptability of the C-SCAT, the sample was heterogeneous with regards to diagnosis and stage of disease. Participants were eligible if they had received at least one previous cycle of chemotherapy to ensure that they had experience with treatment-related symptoms and were not being approached for study participation in the vulnerable period of diagnosis and treatment initiation. Eligibility criteria also included physical, cognitive, and English reading/writing capacity sufficient to complete the C-SCAT as well as availability for data collection 24–96 hours after the initial chemotherapy dose in a chemotherapy cycle, a time at which they would be expected to be experiencing symptoms.

Study Measures

Computerized symptom capture tool (C-SCAT). The Consortium to Study Symptoms in Adolescents with Cancer (CS²AC), composed of five early-career nurse scientists and two senior nurse scientist mentors, conceptualized the C-SCAT based on a symptom cluster heuristics interview guide developed by Dr. Nancy Woods. The C-SCAT app was then developed for delivery via the iPad by computer programmers at Intermountain Healthcare's Homer Warner Center for Informatics Research (HWCIR), which is recognized nationally for its work in clinical decision support and the implementation of innovative information technologies to improve clinical care [30].

The C-SCAT features 30 symptoms commonly experienced by AYAs with cancer drawn from the Memorial Symptom Assessment Scale (MSAS) 10–18 [31]. The MSAS 10–18, developed for use with patients 10–18 years of age, differs from the adult version of the MSAS only in the use of developmentally appropriate language and by the omission of two items: “feeling bloated” and “problems with sexual interest or activity.” The symptoms named in the MSAS 10–18 rather than the adult version were selected to accommodate perspectives of younger AYAs.

The C-SCAT combines graphical images and free text responses in an innovative heuristics approach to gain the perspectives of AYAs on their symptoms and symptom clusters. It presents the symptom menu and directs AYAs to drag and drop those symptoms experienced within the past 24 hours into a designated area on the iPad screen. For each symptom selected, pop-up windows ask about possible causes, alleviating/exacerbating factors, attempted self-management strategies, and the effect of the symptom on daily activities. AYAs can draw connecting lines to indicate which symptoms are related and arrows to indicate causal relationships

among symptoms. They can draw boxes around clusters of symptoms that they perceive to be related and denote the key symptom in each cluster. Additionally, they are invited to provide descriptive information on the temporal nature of the symptoms, names for clusters, the cluster's cause, and its effect on their daily activities. The C-SCAT generates a final graphical image that includes individual symptoms, relationships between symptoms, symptom clusters, and key symptoms within clusters (Fig. 1).

Feasibility. The app's potential for success as a symptom assessment tool was evaluated through: (1) C-SCAT completion rates and reasons for any non-completion selected by participants from a pre-developed list of probable reasons; (2) need for an additional session to complete the C-SCAT (to be offered if a participant was unable to complete in a single session); (3) participant judgment of accuracy of final image as representative of symptom experience; (4) time to complete the C-SCAT; (5) items requiring clarification or coaching to complete; (6) observable fatigue or frustration while completing the C-SCAT; and (7) technical problems.

Acceptability. The research team developed a 19-item questionnaire to evaluate AYAs' perceived acceptability of the C-SCAT. Items addressed perceived ease of use and perceived usefulness, which are central to future adoption [32]. The questionnaire was delivered electronically via the iPad using SurveyGizmo, a secure, online platform for survey delivery [33].

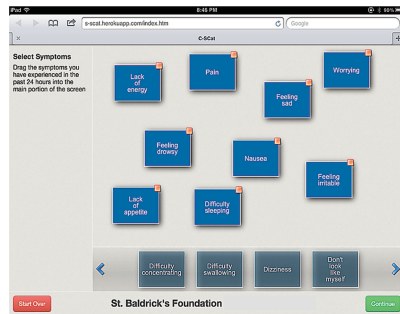
The acceptability questionnaire included items that were rated on a 5-point scale as well as free text items to allow participants to explain their responses or offer suggestions for improvement. Items pertaining to ease of use included clarity of questions posed by the app, ease in following instructions, ease in typing and drawing within the app, and judgment of appropriateness of length of time required to complete the app. Items pertaining to the app's perceived usefulness included boredom while completing the app, how the AYA felt having to think about their symptoms while completing the app, whether the app asked important questions about their symptoms, whether there were other questions that should have been asked, and preference for a computer-based or paper version.

Demographic and clinical data. Demographic and clinical data were obtained from participants' medical records to describe the study sample.

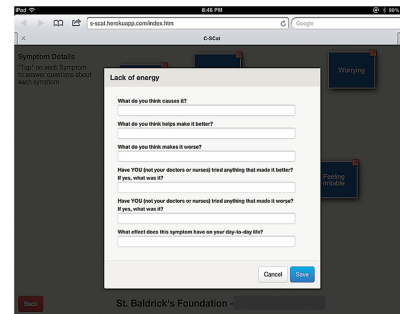
Procedures

Recruitment and enrollment. Following IRB approval, a research team member at each site conducted regular reviews to identify eligible patients. An oncology team member made the initial approach to elicit interest in the study. The research team member met with those interested. Parental permission was obtained first, then patient assent from patients 13 through 17 years of age. Informed consent was obtained from patients 18 years of age and older. Those who requested more time to consider participation were re-contacted within a mutually agreed upon time frame. Those who declined were asked to select from a list of potential reasons for refusal. A confidential list of those who declined was maintained by the research team at each site to ensure that they were not re-approached. All enrolled participants received a \$25 gift card as a token of appreciation.

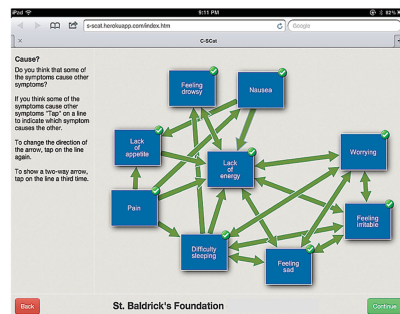
Data collection. Participants completed the C-SCAT 24–96 hours after the initial chemotherapy dose in a chemotherapy cycle on a dedicated study iPad in a quiet private location in either



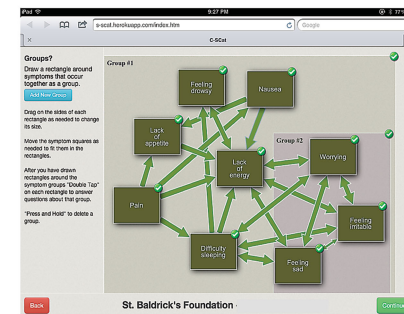
1. Drag and drop symptoms experienced in past 24 hours into designated area of screen



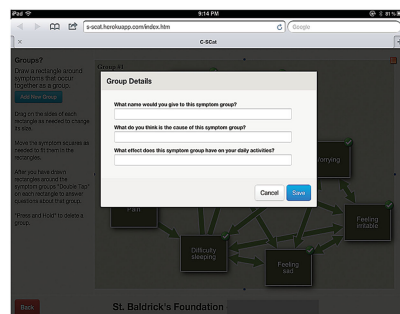
2. Identify symptom cause, characteristics, attempted self-management, and effect on daily activities



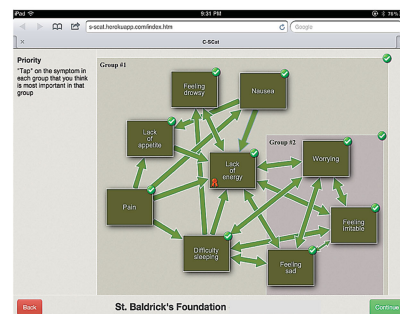
3. Insert lines and arrows to indicate causal and temporal relationships



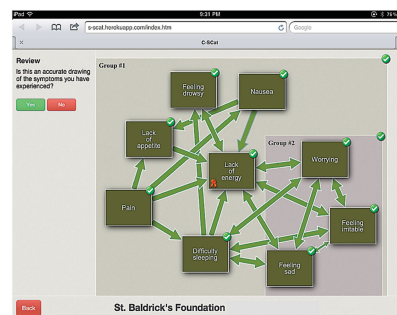
4. Draw boxes around groups of related symptoms



5. Identify key symptom in the cluster, cause of cluster, and effect of cluster on daily activities



6. Give clusters descriptive names



7. Final image of symptom experience can be downloaded or printed

Fig. 1. Example C-SCAT screenshots for steps to completion.

the inpatient oncology unit or outpatient oncology clinic. Following completion of the C-SCAT, participants completed the acceptability questionnaire. A research team member remained available during participant sessions to answer questions and complete an encounter log addressing aspects of feasibility.

Data management and analysis. As the C-SCAT was completed, graphic and text data generated by participants were encrypted and wirelessly transmitted securely to a password-protected Amazon Simple Storage Service (S³) account. Amazon S³ is a secure, distributed network for storing and retrieving data that is compliant with Health Insurance Portability and Accountability Act (HIPAA) standards [34]. Data from each participant included screen shot images of each stage of the app's completion and an Excel worksheet containing free text responses. Data were downloaded from the Amazon Web Services S³ site and stored on an encrypted, password-protected computer in preparation for data analysis. SPSS version 20 for the Mac was used to create data files for statistical analysis. Free text data from the C-SCAT, the acceptability questionnaire, and the participant encounter log were further organized into tables for descriptive content analysis.

RESULTS

Study Participants

Participants included 72 AYA: 40 adolescents (13–18 years; median 15 years) and 32 young adults (19–29 years; median 21.5 years). Fifty-seven percent were male, 79% White/Non-Hispanic, and 29% had a diagnosis of sarcoma. Other demographic data are presented in Table I. Median time since diagnosis was 3 months (range 1–156 months). The sample size was appropriate to evaluate the feasibility and acceptability of the C-SCAT [35].

Ninety eligible patients were approached, 89 agreed to be contacted regarding the study, and 76 (84%) provided informed consent/assent to participate. Reasons for non-participation included: not feeling like participating (N = 3); refusal to participate in any non-therapeutic studies (N = 3); not feeling well (N = 2); lack of interest (N = 1); lack of time (N = 1); and dislike of answering questions (N = 1). Two parents withheld permission for their

adolescent to assent to study participation, in one instance because in the mother's opinion the patient did not have symptoms. One participant withdrew from the study before completing data collection due to not feeling well enough to attempt C-SCAT re-completion after technical problems encountered. C-SCAT data from 72 participants and acceptability questionnaire data from 70 participants were available for analysis (Fig. 2).

Feasibility

All 72 participants completed the C-SCAT successfully in a single session, with 74% (95% CI: 62–83%) reporting that the final image was an accurate or very accurate representation of their symptom experience—"that's how I feel and I made it that way." Comments included; "had everything there that I'm experiencing," "the separate boxes showed a great depiction of what I would describe my symptoms as," "the questions that were asked we're very too the point and were very important (*sic*)," "it graphed it and explained everything well," "makes sense with how I feel and which symptoms occur together," and "it showed a map of how things are connected and what was most aggravating."

The mean time required to complete the C-SCAT was 25 minutes (SD 17, range 2–83 minutes) and was calculated using time/date stamps that were generated as participants completed each component of the app. Participant encounter logs completed by research team members during C-SCAT sessions

TABLE I. Demographics

	Frequency	Percent
Gender		
Male	41	57
Female	31	43
Race/ethnicity		
White/Non-Hispanic	57	79
Hispanic	4	6
Asian/Pacific Islander	3	4
African American	7	10
Other/Multi-racial	1	1
Diagnosis		
Acute lymphoblastic leukemia	10	14
Acute myelogenous leukemia	5	7
Hodgkin lymphoma	16	22
Non-Hodgkin lymphoma	6	8
Sarcoma	21	29
Brain tumor	2	3
Solid tumor NOS	12	17

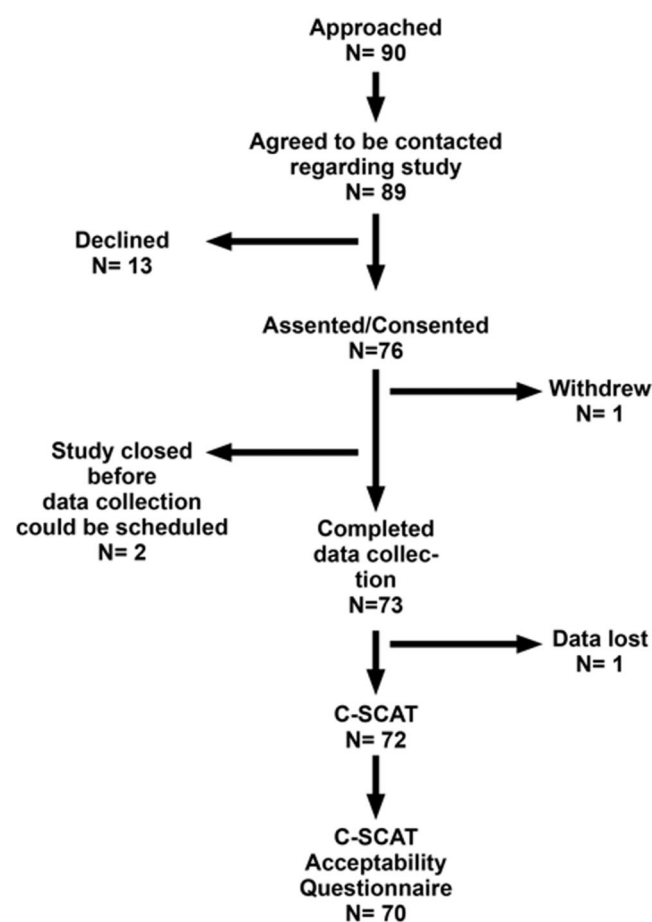


Fig. 2. CONSORT diagram.

TABLE II. Feasibility

Feasibility issues	Description of issue	Frequency
Items requiring clarification/coaching	Seeking clarification to ensure completing “exactly right”	1
	Required explanation regarding how to draw lines and boxes	2
Observable fatigue or frustration	Fatigue + chemotherapy induced nausea, ± sedated from antiemetics	8
	Potentially rushed to complete due to nausea or headache which were severe by end of session	2
	Required reassurance re comprehension of instructions and physical assistance to complete due to nausea	1
	Frustrated that symptom tiles moved after had been placed in group	1
	“felt like a test,” “stressed out,” prefer a “friendlier, more positive feeling” screen appearance	1
Technical problems	Final image did not transmit and participant had to re-complete	1
	Erroneously pressed “back” button on home screen, resulting in exiting system and losing data, requiring retrieval of the image and text data from the Amazon S3 site in order to allow participants to continue and minimize data loss	3
	Period of inactivity resulted in app shutting down, requiring retrieval of the image and text data from the Amazon S3 site in order to allow participants to continue and minimize data loss	1
	App spontaneously shut down requiring retrieval of the image and text data from the Amazon S3 site in order to allow participants to continue and minimize data loss	2
	iPad screen not in locked position so when iPad was turned from vertical to horizontal orientation, participants’ arrangement of symptom tiles was lost	3
	Physical assistance with typing required due to fingernail length or disease-related hand tremor	2

revealed minimal clarification/coaching required to complete each of the screens. Most participants did not display fatigue or frustration while completing the app. Many appeared to find the C-SCAT easy to use. Technical problems were rare (Table II).

Acceptability

Seventy participants completed the acceptability questionnaire. Participants evaluated the C-SCAT’s ease of use and perceived usefulness positively and offered a variety of comments about how to improve both (Table III). In terms of ease of use, participants judged the questions to be clear (89% rated as “clear” or “very clear”), and they endorsed both ease of following instructions (100% rated as “OK” to “very easy”) and ease of typing and drawing (94% rated as “OK” to “very easy”). They felt the length of time required for completion was acceptable (32% rated as “neutral”; 61% rated as “OK”). In terms of perceived usefulness, few reported boredom (38% rated as “neutral”; 49% rated as “not bored”). AYAs described a range of reactions to how it felt to have to think about their symptoms while completing the C-SCAT, as indicated in Table III. Nearly all participants reported that the C-SCAT asked important questions about their symptom experience (99% rated as “somewhat” to “very much”) and that it asked everything it should have (73% indicated “yes”). Likewise, participants indicated strong support for completing a computer-based tool (83%) versus a paper version. Participants indicated familiarity and ease of using touchscreens. One participant additionally commented on the ease of using touchscreens in the context of experiencing peripheral neuropathy that interfered with her fine motor skills.

Participants made multiple thoughtful substantive suggestions for improvement in content and format of the C-SCAT. These included fewer but more focused and less repetitive questions; the

ability to add additional symptoms of their choice; and more engaging color, graphics, and animation.

DISCUSSION

The C-SCAT demonstrated capacity to generate rich relevant data regarding the symptom experience of AYAs with cancer and initial feasibility and acceptability even when completed by those highly symptomatic from chemotherapy. The C-SCAT has potential for empowering AYAs to communicate their symptom experience and impact their symptom management as well as potential for use across other age and diagnostic groups.

As digital natives, AYAs are early adopters and avid consumers of new and particularly, mobile, technologies. Nearly all teens (93%) have access to a laptop or desktop computer in their home, 23% have a tablet computer, and 78% have a cell phone, of which 47% are smartphones [36]. A quarter of teens and half of smartphone-owning teens are “cell-mostly” internet users who mostly go online using their phone [36]. AYAs are accustomed to and comfortable with using technology to communicate their thoughts and feelings about normative life experiences, which favors extension of this methodology to communicating about their symptom experience. Since the report of the Adolescent and Young Adult Oncology Progress Review Group in 2006 [37], AYAs with cancer have emerged as a population who are seeking empowerment to share their unique experiences of cancer and cancer treatment and, equally, seeking empowerment to partner with providers in their care. The C-SCAT has potential to provide such empowerment. By shifting the paradigm to an inductive heuristic approach, the C-SCAT empowers AYAs to describe their unique symptom experience from their own perspective. As one participant said on the acceptability questionnaire, “I think that this is a really cool idea and will be very helpful for everyone.”

TABLE III. Acceptability

Questionnaire item	Example comments
Suggestions for improved clarity of questions	“different questions for different symptoms” “less repetitive” “could have provided examples” “grouping was a little confusing”
Suggestions for improved ease of following instructions	“less words” “give examples (and) pics of what you mean” “make the instructions appear bigger at first and then move to be bullet points on the left” “fix the glitches”
Suggestions for improved ease of typing and drawing	“the arrows could be easier” “keep the boxes from moving if you shake iPad” “make the boxes easier to expand” “make the boxes bigger” “make it more responsive” “the drawings wouldn’t stay where I put them”
Suggestions for improved appropriateness of length of time to complete	“less questions” “less repetitive questions” “make the questions more direct and more specific” “have it be a bit more simple”
Suggestions to improve amount of boredom while completing	“less questions but more specific questions” “less repeating questions” “less typing, more interaction” “make it faster” “more color” “pictures” “more animations” “fun sounds” “explosions...jk(<i>sic</i>)”
How the participant felt having to think about his/her symptoms while completing	“relieving ‘cause I’m sure others have them” “I didn’t have a hard time thinking about my symptoms” “it was fine, it certainly didn’t make my symptoms worse” “it made me more self-aware” “made me notice that I have a lot of symptoms” “made me think about how they relate” “interesting, I learned a bit about my priorities” “it was nice to be able to reflect and focus on how I was feeling” “it made me understand my own symptoms a little better actually” “mind boggling - you don’t really realize how many you have until its spelled out in front of you” “trying to separate the mental from the physical symptoms was hard at times” “normal” “different” “didn’t bother me” “I noticed them more” “made them worse” “sad and stressed” “painful” “weird” “sucky”
What else should the C-SCAT have asked about the participant’s symptom experience	“an option to create your own symptom box” “how does it make you feel” “sexual performance” “muscle weakness” “sensitivity to different smells”
What else would the participant like to say about his/her symptom experience	“it’s not fun” “I don’t like it” “having these symptoms really sucks” “they’re awful” “they make everyday activities much more difficult” “symptoms come in waves” “it’s not nearly as bad as it seems” “it’s tough sometimes but people help you through it”

(Continued)

TABLE III. (Continued)

Questionnaire item	Example comments
Reasons for preference for completing on iPad rather than on paper	<p>“technology makes kids more interested – if you walk in with a piece of paper and a pencil they will think they are doing homework, but if you come in with an iPad they will think they are playing a game”</p> <p>“technological generation”</p> <p>“doing it on paper would be boring and a lot more work to do and most people my age are lazy and wouldn’t want to do it”</p> <p>“it’s incredible technology, there’s nothing exciting about paper”</p> <p>“easier to change mistakes, more organized, more fun”</p> <p>“faster”</p> <p>“very engaging”</p> <p>“entertaining”</p> <p>“the iPad is very cool to play with”</p> <p>“I’m used to typing on touchscreens”</p> <p>“because of my hands and neuropathy easier to do on iPad”</p>

Most significantly, these study findings position the C-SCAT as a tool for clinical pilot testing. It is possible that simply completing the C-SCAT may ameliorate some of the distress experienced by AYAs with cancer. Completing the C-SCAT could facilitate AYAs developing a new heuristic or refining an existing heuristic, as one participant stated, “I was showing what I thought in my head.” Having such a personal explanatory model to facilitate understanding and making sense of their symptom experience could contribute to a sense of coherence with a potential associated reduction in psychosocial distress. More specifically, we also hypothesize that the C-SCAT could directly impact symptom management via two distinct but complementary pathways.

First, completion of the C-SCAT by AYAs could yield insight into their symptom experience to inform self-management efforts: “seeing all my symptoms in one shot, then being told to group them together really made me think more about my disease.” Increased awareness of the totality of their symptom experience, including relationships among symptoms and key symptoms within clusters, could direct AYAs to focus self-management efforts on specific symptoms or clusters. This focus on key priority symptoms and/or clusters could significantly impact management. Completion of the C-SCAT at daily or weekly intervals and comparison of the graphical images generated at each time point could provide AYAs visual tracking of both their symptom experience and, by association, the effectiveness of self-management efforts.

Secondly, the final graphical image generated by the C-SCAT could foster communication between AYAs and providers about the symptom experience, thereby facilitating partnership in symptom management since, as one participant commented, “the doctors don’t always know how we feel.” The call for age-appropriate symptom screening tools for AYAs is recognized as an important element to facilitate optimum symptom management [38]. The C-SCAT may be one such tool. Completion of the C-SCAT by AYAs prior to provider encounters with upload of the final graphical image to the electronic medical record could provide a rich source of data regarding the patient’s symptom experience in a format convenient for providers to rapidly review immediately prior to the encounter. Seeing an image of the patient’s symptom experience (e.g., Fig. 1) might assist providers to unravel the complexity of multiple co-occurring related symptoms. Providers could then begin a focused conversation about the AYA’s symptom experience by asking about key symptoms within clusters, relationships among symptoms, and the presence or paucity of symptoms and relation-

ships among them. Again, as with patient self-management, the C-SCAT’s potential to direct attention to key priority symptoms and/or clusters could significantly impact management. The C-SCAT’s capacity to enhance a provider’s understanding of a patient’s heuristics regarding symptoms and symptom clusters could also reveal opportunities for personalized education of that patient by that provider regarding typical causality, temporality, and relationships among symptoms.

Study findings should inform revisions to the C-SCAT’s content and format. The intent of the research team was to generate and pilot a prototypical tool in order to solicit suggestions from AYA end users of how the C-SCAT could be designed to be more engaging, thus, to optimize the experience of data collection and likely, as a result, optimize the quantity and quality of data collected. The suggestions received from participants were developmentally congruent with AYA preferences and will be incorporated before the C-SCAT is used in future studies. In the absence of an “AYA” version of the MSAS that bridges the gap between the MSAS 10-18 and the adult version, the two items from the adult version of the MSAS which do not appear in the MSAS 10-18 (feeling bloated and problems with sexual interest and activity) may be included in the refined C-SCAT. This would address sexual concerns that are prevalent among and important to AYAs. Specific symptoms suggested by study participants may also be added to the MSAS derived symptoms, such as ‘headache’, which participants viewed as distinct from “pain.” Incorporating game-based features also will be considered. Further refinement of the C-SCAT may also include creation of an abridged version to more directly generate the final graphical image. This could serve as an alternative to daily symptom diaries that traditionally focus on multiple single symptoms rather than yielding a snapshot of the day’s composite symptom experience.

The approach employed with the C-SCAT has potential for translation to populations other than AYAs with cancer. With population-specific modifications to the content and format of the C-SCAT and population-specific evaluation of feasibility and acceptability, the C-SCAT has potential to influence the care of complex, highly symptomatic populations across other age groups experiencing symptoms due to disease, treatment, or conditions such as pregnancy or menopause.

This study had several limitations that should be considered when interpreting results. The young adult subset of the study sample was relatively young (median age 21.5 years), limiting the

generalizability of the findings to older young adults. Additionally, many participants were receiving sedating antiemetic medications, which potentially limited their ability to use the C-SCAT as evidenced by eight instances of observable fatigue or frustration in the context of receipt of these medications in proximity to completing the C-SCAT.

In conclusion, this study provides evidence of initial feasibility and acceptability of the C-SCAT as an innovative, new tool for exploring symptoms and symptom clusters in AYAs with cancer using a heuristics approach. Further research is needed to determine the C-SCAT's effectiveness to empower AYAs to communicate their symptom experience and impact their symptom management.

ACKNOWLEDGMENTS

The authors gratefully acknowledge funding for this study received from the following sources. Funding for adolescents at Primary Children's Hospital, Seattle Children's Hospital, and Children's Mercy Hospital from St. Baldrick's Foundation Supportive Care Grant 2011–2013 (Linder, PI). Funding for young adults: at Primary Children's Hospital from University of Utah College of Nursing Faculty Research Grant (Linder, PI); at Seattle Children's Hospital from Seattle Children's Guild Association Teen Cancer Grant (Macpherson, PI); at Children's Mercy Hospital from Hyundai Hope on Wheels ((Stegenga), Fulbright, PI), at University of Virginia Health System from University of Virginia School of Nursing (Erickson, PI); at Virginia Commonwealth University Health System from Grant # P30 NR011403 Center of Excellence for Biobehavioral Approaches to Symptom Management; National Institute of Nursing Research, NIH ((Ameringer), Grap, PI). Pamela S. Hinds, PhD, RN, FAAN, from Children's National Medical Center, Washington, DC, has been a generous source of expert and tremendously appreciated mentorship and intellectual supportive guidance through all the work of CS2AC. Matthew Ebert at Intermountain Healthcare's Homer Warner Center for Medical Informatics Research (Salt Lake City, UT) provided invaluable support in programming the C-SCAT. Kate Sweeney, medical illustrator of UW Creative at the University of Washington, assisted with the design of Figures 1 and 2. Our colleagues and research staff at each data collection site made this study possible by their commitment to conducting clinical research with AYAs. The AYAs who gave so generously of their time and energy in this study to assist us in developing a tool to ultimately improve symptom management for other AYAs with cancer will inspire our future efforts. We dedicate this work to one of our adolescent participants who provided us with data of remarkable richness and complexity yet unfortunately did not live to see the study completed.

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