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Research Article

Development of a Questionnaire to Screen Physical Health and Psychosocial Issues among Adolescents

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A B S T R A C T

Background: Adolescent patients often present with non-specific problems. Often it is difficult to find the need of a detailed medical evaluation that may last for several hours and over more than 1 visit.

Objective: To develop a questionnaire for screening physical health and psychosocial issues among adolescents.

Study Design: Development of screening questionnaire using mixed methods.

Particpants: Expert panel and adolescents.

Method: Case record forms of adolescents registered at Centre for Adolescent Health (CAH), Kalawati Saran Children's Hospital, New Delhi were reviewed and problems were identified. Henceforth questions were framed by an expert panel as a bilingual draft which was then tested on adolescents. Several questions were modified; a few new questions were also added after the expert panel review.

Outcomes: Finally, two different questionnaires were developed for adolescents, one for those who were less than 13 years and the other for those who were more than 14 years of age. As a few questions were related to menstrual issues, we decided to have a separate questionnaire for boys and girls above 14 years.

Results: Testing of the second version was done and minor errors were rectified. Hence, the final screening tool was prepared which was comprehensive, bilingual, and easy to use. Cronbach's alpha value of the questionnaire is 0.86.

Conclusion: The screening questionnaires were developed for screening physical health and psychosocial issues in adolescents. These questionnaires have good psychometric properties.

Keywords: Non-communicable Diseases, Adolescent Health, Psychosocial Health, Tool Development, Screening Health Questionnaire, Schools, Suicide

Introduction

In India, adolescents constitute nearly 21% of the population i.e., 253 million.[1] Adolescence refers to the age between 10 and 19 years[2] which is associated with extensive physiological and psychological changes in the body and leads to increased vulnerability and development of various problems. A considerable proportion of adolescents face challenges due to factors like poverty, ignorance, obsolete social norms, missed opportunities, illiteracy, early child-bearing and discrimination. These challenges influence adolescent morbidity and mortality, and most of these social adversities can be prevented.

According to the World Health Organization (WHO),[3] nearly 30% of diseases globally have their origin during the adolescent period only; the main causes of mortality in the year 2012 were traumatic injury, suicide, interpersonal violence, HIV, and lower respiratory infections; and the top 5 causes of morbidity (years-lost-to-disability) in 10-14 year olds in 2000-2012 were unipolar depressive disorders, followed by iron deficiency anaemia, bronchial asthma, pain in neck and back, and anxiety disorders. WHO also estimates that around 10-20% of them suffer from mental health issues yet remain largely undiagnosed and untreated, and half of these conditions start by the age of 14 years.[4] In India, the National Family Health Survey-5 found that in the 15-19 years age group, 59.1% of females and 31.1% of males were anaemic, nearly half had undernutrition, and 20.6% of females and 18.9% of males suffered from obesity.[5] It has been found that 63% of all deaths in India occur due to non-communicable diseases (NCDs). It also leads to morbidity in urban and rural areas, with significant loss of productive years of life. The overall prevalence of diabetes, hypertension, tobacco use, and obesity has been estimated to be 8%, 24%, 11%, and 4% in 2014-16 in India.[6] As most of the risk factors are preventable like lack of physical activity, poor eating habits, stress, and substance abuse, promoting a healthy lifestyle from the start is gaining importance day by day. This adolescent period provides a perfect opportunity to reinforce this positive behaviour so as to prevent non-communicable diseases. However, timely detection of risk factors remains critical to such interventions clinically.

It is not possible to clinically evaluate all adolescents for these risk factors and for the presence of not-so-apparent diseases like anxiety, depression, and psychosis. Therefore, we strived to find an easy method of screening to identify adolescents requiring detailed medical evaluation and counselling. We developed a simple self-answered tool for adolescents for disease screening using methods described earlier.[7,8]

This tool is in the form of a screening questionnaire covering most of the above issues and other adolescence specific concerns. We have described the process of development of this screening questionnaire in this article.

Method

Participants

This study was done at the Centre for Adolescent Health (CAH), Lady Hardinge Medical College, Kalawati Saran Children's Hospital (KSCH), New Delhi and in nearby schools from August 2012 to September 2014 with an objective to develop a screening tool to screen the adolescents for physical and mental health issues, various risk factors for chronic diseases, and other concerns. Inclusion criteria were adolescents (10-19 years) studying in school or attending OPD of KSCH. Adolescents having acute sickness (like fever, vomiting, diarrhoea, pain abdomen, breathing difficulty) or not being able to read or write Hindi/ English were excluded. The study was approved by the Institutional Ethics Committee. Written informed consent was taken from the parents and assent was obtained from the adolescents.

Steps of Development of Screening Questionnaire

One screening questionnaire (26 questions) was in use at our centre, which became the starting point. Case record forms of 385 adolescents who were already registered with CAH were reviewed. The study team also reviewed the literature to find common issues and problems relevant to the adolescents of India. These issues were framed into simple questions. More than 100 such questions were framed. Then a meeting of an expert panel consisting of faculty from Paediatrics, Obstetrics & Gynaecology, Psychiatry, Psychology, Anthropology, Dermatology, Community Medicine, and Social Work was convened to discuss each and every question. Cultural relevance, ease of understanding, clarity, and epidemiological significance were the basis of selecting appropriate questions. Some questions were modified. Based on the questions selected in the experts' meeting, a screening tool was developed. This tool contained questions on physical issues, psychosocial issues, adolescence related concerns, sexuality, depression/ suicide, STI/ RTI, and risk factors for non-communicable diseases.

It was also decided that it would be better if two different tools were developed, one for adolescents up to 13 years, and the other for adolescents who were 14 years or older. Accordingly, two different tools were framed for these age groups. Tool for older adolescents had additional questions on topics like sexuality. Thus, final draft-I was made which had 46 questions for adolescents up to 13 years and 53 questions for adolescents who were 14 years or older.

Simultaneously, the process of translation of questions from English to Hindi was also carried out. The persons involved included native Hindi speaking persons who could understand English well, Hindi translators, school

teachers, nurses, doctors, and adolescents. The translated questions were retranslated in English and this process was repeated until a suitable language could be found. Thus, we developed a unique 'bilingual' screening tool.

This questionnaire was then filled out by a large number of adolescents (578 adolescents from OPD and schools). It was analysed and the findings were discussed by focused group discussions (FGDs) with adolescents, parents, and health care workers. FGDs emphasised on the appropriateness of questions, language, font type and size, paper size and its orientation, cultural aspects, objectionable questions, and utility of the tool. The study team also interacted with adolescents who participated in the study.

Our tool included an option - "could not understand the question". This helped us in identifying the questions to be deleted or modified. On the basis of the observations and analysis of draft-I, a revised questionnaire was framed by inviting the same expert panel. Several questions were modified while a few new questions were added. A new, revised questionnaire was considered as draft II.

Draft II was tested for understanding and typographical errors. Nursing students filled out about 20 screening questionnaires of this draft. These were evaluated and FGD with these students revealed some errors which were rectified.

The final questionnaire was printed for adolescents less than 14 years and those above 14 years of age. As few questions were related to menstrual issues, hence it was further decided to have a separate questionnaire for boys and girls above 14 years of age. Table 1 shows the profile of different questionnaires. Also, Figure 1 summarises the various steps followed in the development of the final questionnaire.

Statistical Analysis

The filled questionnaires were kept separately and confidentiality was maintained. The information collected was entered in an Excel spreadsheet by a data entry operator. Data collectors were not involved in the data entry. Statistical analysis was done by importing the spreadsheet of Excel to STATA version 8.2. Tabulation and summary of the sample were prepared using numbers and percentages/ proportions. Co-relation analysis and estimation of Cronbach's alpha was done using STATA.

Results

Draft I was assessed for its utility on the below-mentioned parameters.

Acceptance: adolescents found it easy to use and did not face any difficulty to fill it; (2) Completion: all patients could complete the questionnaire in one sitting taking 5-10 minutes, a few patients (6%) did not answer one or other questions; (3) Understanding: Questionnaire consisted of four options for each question - never, sometimes, often, and did not understand the question.

Around 14% answered "did not understand" in one or other question; and (4) Relevance of responses: Responses were more or less the same as findings from structured clinical interviews.

The conditions which can be identified using this screening tool are scholastic performance, height and weight-related issues, depression/ suicide, anxiety, anger, behavioural problems, self-image or developmental issues, family environment/ adjustment related problems, substance abuse or high-risk behaviour, attention disorders or risk factors for chronic diseases.

The FGDs and in-depth interviews conducted with parents, adolescents, nurses, and teachers led to the main change of segregating the questionnaire for adolescents less than 14 years and those above 14 years of age. A question about sexuality (Do you have a friend who has experienced sex?) was considered too sensitive and was removed.

The draft I was printed on yellow and pink paper for boys and girls respectively. This was tested on 578 adolescents from schools and OPD and the responses of every question were analysed. Questions that many adolescents could not understand were removed or modified. Correlation between various questions was reviewed. Questions having very high correlation were modified or removed.

Table 1.Question Profile of different Drafts of the Questionnaire

	Initial Questionnaire	Draft I		Final Questionnaire		
		≤ 13 years	≥ 14 years	≤ 13 years	≥ 14 years (girls)	≥ 14 years (boys)
Total number of questions	26	46	53	25	31	30
Questions with 4 options*	Q1 to Q24	Q1 to Q41	Q1 to Q41, Q47 to Q53	Q1 to Q20	Q1 to Q20, Q26 to Q31	Q1 to Q20, Q26 to Q30
Questions with 3 options**	Q25 & Q26	Q42 to Q46	Q42 to Q46	Q21 to Q25	Q21 to 25	Q21 to 25

*Never, Sometimes, Often, Did not understand the question;**Yes, No, Did not understand the question

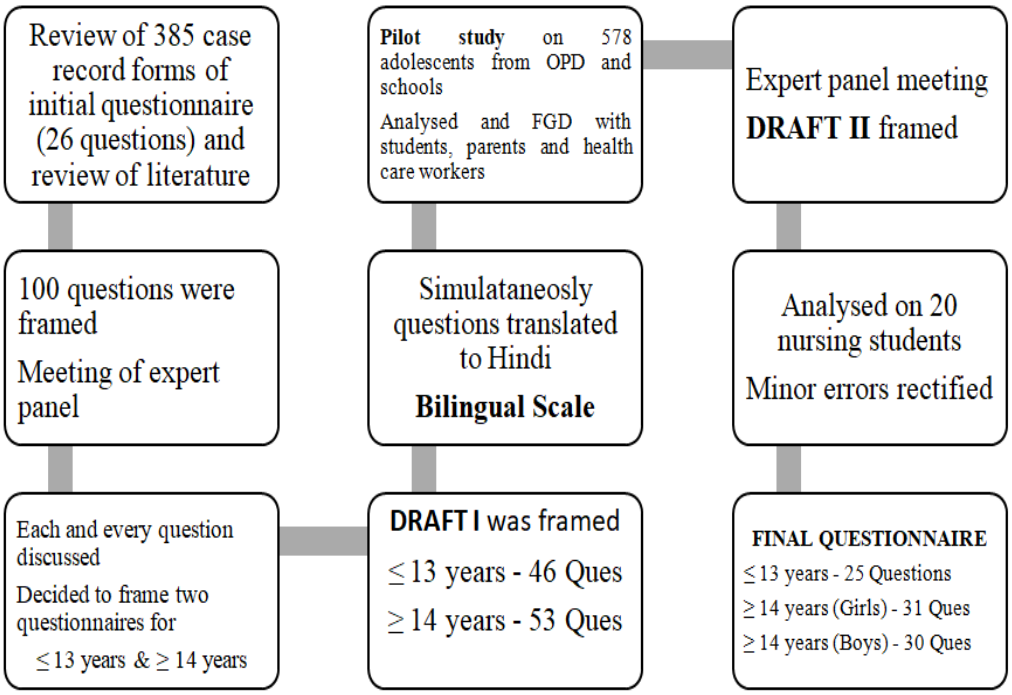

Figure 1.Summarising the Steps of Development of the Questionnaire

In co-relation analysis, most (57.9%) questions were correlated within a range of 0.0 to 0.3. Rest 42% had a correlation in the range of 0.3 to 0.4. The correlation between question 10 and question 30 was 0.410 and it was 0.410 between question 11 and question 29. These questions were later modified to decrease the correlation between them.

Psychometric properties of the questionnaire were also tested using Cronbach's alpha (Table 2). This showed very good psychometric properties for the complete questionnaire (0.86). Questions were removed one by one to check whether this removal of a question led to an increase in the value of Cronbach's alpha (Table 3). Some questions were identified, which when removed increased the value of Cronbach's alpha. Such questions were modified.

In addition to the above, the study team reviewed all the questions subjectively to identify the questions requiring reframing or removal on the basis of the experience gained through personal interviews, examination of adolescents, and matching their responses. The issues identified by the subjective review nearly matched the issues identified by statistical analysis.

This draft II was then pilot tested on 60 adolescents of whom 30 were in-house adolescents and 30 were from school. The conclusion and analysis of the testing results were again discussed with the experts and on the basis of this, preparation of the final draft II of the questionnaire was done.

Our final questionnaire consists of different questions pertaining to various aspects of health. A few questions have been framed such that they check different spheres of health simultaneously. As shown in Table 4, different health aspects which are covered through our questionnaire are (a) Physical Health: Q 1, 2, 3, 5, 9, 13, 21; (b) Psychosocial Health: Q 3, 4, 6, 7, 9, 12, 14, 18, 19, 21, 22; (c) Mental Health: Q 8, 10, 11, 12, 14, 15, 16, 17, 21, 22; (d) Suicidal Risk: Q 23, 24; (d) High Risk Behaviour: Q 20, 26, 27, 28, 29; and (e) Risk for non-communicable diseases : Q 25 (a, b, c, d).

Table 2.Internal Validity of the Draft I by Cronbach's Alpha

	Up to 13 Years	14 Years and Above			
		(A)	(B)	(C)	(D)
Cronbach's alpha	0.858	Up to 41 questions	(A) and yes/ no questions	(B) and girls questions	(B) and boys questions
		0.8693	0.8757	0.850	0.893

Table 3.Removal of Questions from Draft I increasing Reliability

Questions	Up to 13 Years	14 Years and Above					
		Up to Q41	Up to Q41 + Y/N Q	Up to Q41 + Y/N Q + Girls	Up to Q41 + Y/N Q + Boys	Up to Q41 + Girls	Up to Q41 + Boys
Questions whose removal increases reliability	Q9, Q35, Q37	Q1, Q9, Q14, Q15, Q16, Q23, Q35, Q37	Q1, Q9, Q14, Q15	Q9, Q19, Q48, Q52	Q1, Q14, Q15, Q16, Q43, Q51	Q17, Q19, Q36, Q48, Q52	Q1, Q15, Q16, Q51
Questions found	Q1, Q9, Q14, Q15, Q16, Q35, Q37						

Table 4.Questions in Our Final Questionnaire

S. No.	Question/ Item (Up to 13 Years of Age)
1.	Do you feel your height or weight is above or below normal?
2.	Are you troubled by pimples and acne so much so that you avoid meeting people or going out with friends?
3.	Do you get worried about the changes (like breast size, change in private parts and facial hair) so much that it disturbs your studies and daily routine?
4.	Do you feel that you are suffering from some serious illness?
5.	Do you face any problem in taking an active part in sports activities?
6.	Do you easily get influenced by friends for doing avoidable activities (like bunking classes, smoking, and teasing others)?
7.	Do you feel so much attracted to someone that you do not feel like studying at all?
8.	Do you feel sad or unhappy?
9.	Do you feel less energetic or easy fatigability?
10.	Do you feel less interested in activities that were earlier enjoyable?
11.	Do you have any trouble falling asleep, staying asleep, or sleeping too much?
12.	Do you worry a lot (for eg., future misfortunes etc.)?
13.	Do you feel sweaty, heart-pounding, dizziness, or dry mouth?
14.	Do you feel restless, trembling, tremors, difficulty in relaxing, fidgeting, tension, or headache?
15.	Do you find difficulty in following instructions?
16.	Do you find difficulty in sitting for a sustained period?
17.	Do you find difficulty in concentrating on work or studies?
18.	Do you find that other people get annoyed because of the things you do?
19.	Are there any arguments and fights with friends, parents, and teachers?
20.	Do you get blamed for lying, stealing, destroying the property, running from school or home, or harming the animals?
21.	Do you think you have any such problem for which you need to consult a doctor/ counsellor/ health worker?
22.	Do you have any friends or relatives or other persons with whom you can share your feelings or experiences?
23.	Has there been a time in the past month when you have had serious thoughts about ending your life?
24.	Have you ever, in your whole life, tried to kill yourself or made a suicide attempt?
25.	(a) Do you exercise or participate in outdoor games at least five days a week? (b) Do you watch TV/ computer or spend time on mobile for more than two hours per day? (c) Do you consume fruits, fruit juices, or green leafy vegetables in your routine diet at least five days a week? (d) Does anybody in your family (parents, siblings, grandparents, maternal grandparents etc.) have high blood pressure, diabetes, or any heart disease?

Additional Questions (14 years of age and above)	
26.	Do you consume any kind of tobacco (bidi, cigarette, hookah, gutkha etc.)?
27.	Do you consume any kind of alcohol (beer, whiskey, vodka etc.) or drugs (ganja, charas etc.)?
28.	Do any of your friends get involved in sexual activities?
29.	Do you enjoy touching/ rubbing/ handling or fidgeting with your private parts so much that it disturbs your day-to-day life?
Additional Question: Boys (14 years of age and above)	
30.	Do you get troubled by night emissions/ nightfall/ wet dreams so much so that it disturbs your daily routine?
Additional Question: Girls (14 years of age and above)	
31.	Does your menstrual cycle disturb your daily routine?
32.	Do you have stomach ache/ foul-smelling discharge/ any infection or injury in your private parts?

Discussion

The main achievement of this study is the development of a screening tool that has very good psychometric properties, high internal validity, and good discriminant abilities. This tool has special characteristics including (1) comprehensive - this tool includes issues related to physical concerns, psychosocial issues, family issues, abuse, suicide, and depression, and also collects information on nutrition/ diet, risk factors for non-communicable diseases, and physical activity; (2) bilingual - this tool is in Hindi and English and it facilitates better understanding of the included questions, (3) validity - this tool has an option of 'did not understand the question'. This is important as some adolescents may not understand the appropriate meaning of the written language. The scoring would be erroneous if such questions are included for it. Moreover, this option also provides an opportunity for initiating a discussion on the issue linked to the question not well understood. In case the respondent marks many questions as not understood then the screening tool becomes less useful.

A 5-stage process comprising of (1) prioritising important domains to be included, (2) constructing questions with relevant content, (3) prior testing of questions, (4) assessing test-retest reliability, and (5) checking for construct validity, was used for the development of a food and physical activity behaviours questionnaire for the Expanded Food and Nutrition Education Program (EFNEP),[9] a nutrition education programme serving low-income families in the USA. Similar steps were followed to develop our multidomain questionnaire.

Also, a questionnaire was made to assess perceptions and use of canned foods among college students in Utah, US.[10] Initial information was reviewed from the Canned Food Alliance consumer survey and online educational materials. Then, 8 college students were interviewed followed by the assessment of content validity and reliability.

Zhou[11] developed a m Health App Us ability Questionnaire (MAUQ) in Pittsburgh after reviewing various existing scales. The initial draft was then assessed by experts for clarity and relevance. Subsequently, further refinement of the draft was done after various face to face meetings with the experts. The final draft was then evaluated for usability and validity.

It has been observed that biased responses depend on the language of the questionnaire/ tool, question type, and also on the order of questions. Hence, the order of the questions is very important. What works best is to avoid questions having any controversy or high emotional content at the beginning as far as possible. A high level of non-response to particular questions substantially helps in identifying problematic items. Also, a sufficient amount of pilot work, with an appropriate sample size, needs to be done during the process of developing a new questionnaire. Most importantly, it helps in identifying the questions that are lacking in clarity or are inappropriate. A Cronbach's α value of < 0.70 is suggestive that the questions are poorly grouped.[12]

A similar study was done by Dr Tsu-Yin Wu et al.[7] in 2002 on developing a questionnaire for measuring physical activity cognitions among Taiwanese adolescents. Psychometric testing of this questionnaire had satisfactory internal consistency and validity using Cronbach's alpha (0.79 to 0.90).

Also, J Kupfer[8] used a similar method in 2003 for the development of questionnaires for children and adolescents suffering from atopic eczema to check on coping with the disease and itching cognitions. The final questionnaire was tested on 204 children and 168 adolescents. Cronbach´s α was 0.66-0.89 which was between satisfactory to good value.

Greco et al.[13] in 2011 developed and validated the Child and Adolescent Mindfulness Measure (CAMM). It included

4 studies (n = 1,413). It was suggestive that the CAMM is an apt measure and has sufficient internal consistency. Hence, CAMM may serve as a useful measure.

Also, Byrne et al.[14] in 2011 developed the adolescent stress questionnaire (ASQ). An old instrument was developed by the first author in which adolescents identified their stressors. These questions were then administered to numerous school-going adolescents (N > 1000). Further analysis was done which showed that the questionnaire measured anxiety, self-esteem, and depression effectively.

This tool can be used for screening adolescents for various purposes clinically. This is likely to identify quickly the adolescents requiring detailed medical/ psychological evaluations and the issues to be addressed. It will also help in the identification of medical emergencies (related to suicide) and the presence of risk factors for NCDs. It will also provide us with a platform for disseminating information and thereby sensitising the adolescents on various aspects. In addition to the above, the tool can potentially be useful in other settings like schools to identify the adolescents having significant issues. The tool can be further studied in various settings in different parts of the country. This tool was tested in a school setting and it is being published separately. As this tool is in Hindi and English, it can be translated into other languages for use in other parts of India. The tool can also provide a treasure of data on various issues.

However, this screening questionnaire has been developed keeping in mind various issues faced by Indian adolescents. Before using it in other countries, different cultural and social values should be considered in addition to the language.

This tool can also be used in clinical settings, where history taking process will be complemented by the responses to the questions in this tool. Thus, this is likely to reduce the time taken for screening interviews and is also likely to fetch answers to sensitive issues like sexuality, addictions, and suicidal tendencies.

What is already known?
Several disease-specific questionnaires are available to screen the adolescents.
What does this study add?
This study developed a questionnaire that can potentially assess the need of detailed medical evaluation of adolescents across the age groups of 10-18 years in boys and girls in various settings.

Conclusion

The study completed with the development of screening tools for adolescents to screen for common physical concerns, psychosocial issues, family issues, abuse, suicide, and depression, along with information on nutrition/ diet, and risk factors for non-communicable diseases. This is a bilingual (Hindi and English) and self-filled tool by the adolescents. The health care providers can find the issues easily through this filled questionnaire to decide for a detailed evaluation of the respondent.

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Authors' Contributions

Dr Harish K Pemde conceptualised and designed the study. He was actively involved in the execution of all the steps of the study. Dr Pallavi and Dr Sathya contributed by conducting the study and in the analysis and interpretation of data. They also drafted the initial draft with further modifications and inputs from other authors. Dr Dinesh Kataria and Dr Swati Patra critically reviewed the manuscript and gave valuable intellectual input.

Online Annexures: Screening questionnaires are available online.

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Conflicts of Interest: None

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