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Depression in pediatric care: is the WHO-Five Well-Being Index a valid screening instrument for children and adolescents?

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Abstract

Objective: This study investigated the criterion validity of the WHO-Five Well-Being Index (WHO-5) in screening for depression in pediatric care.

Method: A total of 446 children aged 9 to 12 and 324 adolescents aged 13 to 16, recruited from pediatric hospitals, completed the WHO-5 and a structured diagnostic interview serving as the gold standard. Diagnoses of depressive disorder included major depression and minor depression. Criterion validity was analyzed using the area under the receiver operating curve (AUC). Sensitivity and specificity were computed for optimal cutoffs. Additionally, unaided clinical diagnoses of depression made by the attending pediatricians were assessed.

Results: Diagnoses of depressive disorder were established for 3.6% of children and 11.7% of adolescents. AUCs were .88 for the child and .87 for the adolescent sample. A cutoff score of 10 for children maximized sensitivity (.75) and specificity (.92). For the adolescent sample, decreasing the cutoff score to 9 yielded optimal sensitivity (.74) and specificity (.89). Sensitivity of the unaided clinical diagnosis of depression was .09, while specificity was .96.

Conclusions: The WHO-5 demonstrated good diagnostic accuracy for both age groups. Further evidence is needed to support the feasibility of the WHO-5 as a depression screening instrument used in pediatric care.

Keywords: WHO-5; Screening; Depression; Validity; Pediatric Care

1. Introduction

Over the whole life span, depression is one of the most prevalent mental disorders. Approximately 2.8% of children up to 12 years are affected by the disorder [1]. During adolescence, the point prevalence approaches adult levels at 5.6% [1]. In health care settings, the prevalence tends to be higher: 6% of pediatric care patients aged 7 to 14 were diagnosed with a depressive disorder [2].

Despite the existence of effective treatments, depression among children and adolescents often remains undetected and thus untreated [3]. Without adequate treatment, early-onset depression is a powerful predictor of continued mental health problems in adulthood [4,5]; this also applies to minor depression [6]. Given the serious consequences, early recognition of major as well as minor depression is of great importance.

Since the majority of depressive patients experience somatic symptoms, general practitioners and pediatricians are often the first to be consulted by a young person [7]. Hence, they can play a key role in the course of the illness [8,9]. However, general practitioners and pediatricians frequently report low confidence in their ability to diagnose depression [10,11] and indeed fail to recognize many cases [12,13].

One way to improve recognition rates is the application of screening instruments [14–16]. Suitable screening instruments for children and adolescents should be sensitive, specific, brief and simple in wording and response format.

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There are a number of screening instruments specifically designed for children or adolescents. A popular brief screener for children is the Short Mood and Feelings Questionnaire-Child Version (SMFQ-C [17]), which however seems to miss out on many cases of depression [17,18]. For the adolescent age group in particular, there is a bigger variety of brief instruments. In contrast to the performance in children, the SMFQ-C showed good diagnostic accuracy in adolescents [19]. The Patient Health Questionnaire for Adolescents (PHQ-A [20]) demonstrated satisfactory sensitivity and high specificity, albeit there is only a single validation study [20]. Favorable results [21,22] were also found for the novel *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV)-oriented evaluation scales of the Youth Self-Report (YSR [23]), as well as for the newly developed Depression Screener for Teenagers [24] that demonstrated high diagnostic accuracy [area under the curve (AUC)=.91] [24]. In sum, there are only a few studies investigating criterion validity of screening instruments specifically designed for children or adolescents.

In addition to these age-specific instruments, established brief screening instruments that were designed for adults have been validated in adolescents. In this case, it is important to ensure that the wording and response format are suitable for the younger age group. Various short forms of the Center for Epidemiologic Studies Depression Scale (CES-D [25]) yielded inconsistent results on their validity in adolescents [26–28]. Other screeners were applied more successfully among adolescents such as the Beck Depression Inventory for Primary Care (BDI-PC [29]), the nine-item depression scale of the Patient Health Questionnaire (PHQ-9 [30]) and the PHQ-2 [31]. Winter et al. [32] reported an excellent AUC of .98 for the BDI-PC, while the PHQ-9 yielded an AUC of .88 with a sensitivity of .90 and a specificity of .78 for adolescents enrolled in a health care delivery system [33]. In the same sample, an AUC of .84, a sensitivity of .74 and a specificity of .75 were found for the PHQ-2 [34].

Another adult instrument that has been investigated in adolescent samples in two studies so far is the WHO-Five Well-Being Index (WHO-5 [35]). In contrast to all previously mentioned screening instruments, the WHO-5 screens for depression indirectly by questioning well-being using positively formulated items instead of directly referring to common symptoms of depression. This characteristic might increase patient acceptance. When visiting a physician for somatic reasons, patients may perceive questions about depressive mood as irrelevant and may be more inclined to report on their well-being. The WHO-5 yielded a sensitivity of .89 and a specificity of .87 for any depressive disorder as compared to the CES-D cutoff of 16 in a sample of diabetic adolescents and was judged as easily comprehensible [36]. In a very recent multicenter study among adolescents aged 14 to 16 visiting general practitioners [37], diagnostic agreement between the WHO-5 and the Composite International Diagnostic Interview [38] was .89 [39]. At the optimal cutoff of 11 for the detection of any depressive disorder, sensitivity was .88 and specificity was .80 [39]. So far, no study has examined the validity of the WHO-5 administered to children.

The aim of the current study is to examine the criterion validity of the WHO-5 as a screening instrument for depression among child and adolescent patients from pediatric hospitals. This is the first study investigating the validity of the WHO-5 in children. For adolescents, support for the application in this specific setting should be gained. To put the screening results into context, the recognition rate of depressed patients by the attending pediatricians was assessed.

2. Methods

2.1. Procedure

Data collection took place between September 2009 and November 2010 in three pediatric hospitals and three pediatric surgery hospitals in Munich, Germany. Divided into inpatient and outpatient departments, the pediatric hospitals addressed the full range of pediatric diseases, from the common to the complex ones. Inpatient departments were specialized on acute and chronic diseases (e.g., diabetes, cystic fibrosis), while outpatient departments mainly focused on diagnostic clarification or long-term treatment (e.g., hyposensibilization). In the pediatric surgery hospitals, patients presented with the whole spectrum of surgical problems.

Recruitment was arranged sequentially in time frames of 3 months for each hospital. Every work day, all newly admitted inpatients aged 9 to 16 as well as all outpatients in this age group having an appointment in the hospital and their parents were invited to participate. Participants were assigned either to the child sample (age 9–12) or to the adolescent sample (age 13–16). Inclusion criteria were (a) sufficient health, (b) satisfactory general cognitive abilities and (c) adequate German language skills for independent completion of the questionnaire. For inpatients, a minimum stay of 2 days was an additional criterion. Patients with acute medical impairment (e.g., postsurgery status), insufficient cognitive abilities or insufficient German language skills were excluded. The medical staff judged whether any of these exclusion criteria were present. For logistical reasons, inpatients who were hospitalized for only 1 day had to be excluded. The patient flow is displayed in Fig. 1.

After written informed consent was given by the patients and their parents, the patients completed the WHO-5. In addition, the attending pediatricians — who were blind to the screening result — had to judge whether the participant was suffering from depression. Within 1 week of completion of the screener, a structured diagnostic interview was conducted serving as the gold standard. Patient interviews were used as the patient himself is the most important source of information when suffering from an internalizing disorder