WETENSCHAPPELIJK CONCEPTARTIKEL

Detection of psychosocial problems in 10-12 year olds in the Netherlands: the SIPP study

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Abstract

Introduction

Recent findings from the Health Behaviour in School-aged Children (HBSC) study highlight an alarming increase in psychosocial problems among 10 to 12-year-olds, from 14% in 2017 to 33% in 2021. However, the Youth Healthcare Services (YHS) of the Municipal Health Service Utrecht has maintained a steady detection rate for psychosocial problems of around 8% for years. This study aimed to investigate whether augmenting routine periodic developmental assessments, incorporating standardized well-being questions with smiley responses administered to children alongside the standard procedure, enhances the detection of psychosocial problems in this age group. Additionally, we explored the identification of different types of psychosocial problems.

Method

A total of 542 children aged 10-12 years old underwent a routine periodic developmental assessment. The control group (n=256) received the standard procedure (parent questionnaire, parent Strengths and Difficulties Questionnaire (SDQ) and a non-standardized screening interview with the child), while children in the intervention group (n=286) received an oral well-being questionnaire with smiley responses instead of the non-standardized interview. Follow-up consultations were offered when SDQ scores were elevated, when parents had questions, and when the screening interview yielded anomalies or when one or more well-being questions were answered with 'neutral' to 'poor'. During the follow-up consultation, the youth healthcare professional assessed the accuracy of the detection, documented the nature of the problems, and evaluated the need for additional care or support.

Results

In the intervention group, psychosocial problems were accurately detected in 79 children, compared to 10 children in the control group (aOR 11.71, 95% CI 2.62 – 52.37). Furthermore, more children with a need for additional care and support were identified in the intervention group (10.8%) compared to the control group (0.4%). Due to the low number of detections in the control group, comparative analyses regarding the identified types of problems could not be conducted.

Conclusion

Integrating standardized well-being questions with smiley responses into routine periodic developmental assessment significantly increases the accurate detection of psychosocial problems in 10 to 12-year-olds. These findings emphasize the importance of involving children in health and developmental assessments and highlight the potential of simple tools, such as smiley-based questions, to identify a broader spectrum of psychosocial problems. This approach holds promise for facilitating early detection and intervention, contributing to the overall well-being of children during this critical developmental phase.

Key words: mental health, psychosocial problems, screening, detection, early adolescents, children.

Introduction

Early adolescence (11-14 years of age) is a critical developmental phase for shaping social-emotional habits pivotal for future mental health.[1] Negative experiences during this developmental stage, whether in homes, schools and other environments, can escalate the risk of psychosocial problems, often manifesting as disorders in adulthood if not addressed early.[2] Globally, 1 in 7 children between the ages of 10 to 19 experience psychosocial problems, yet these often go unrecognized and untreated. Approximately 35% of individuals with mental health issues have an onset before the age of 14.[3,4]

The Health Behavior in School-aged Children (HBSC) study (2021)[5] indicates a concerning rise in psychosocial problems in (early) adolescence, particularly in girls. Primary school girls reported a significant rise in emotional issues, from 14% in 2017 to 33% in 2021, and both boys and girls report an upsurge in behavioural problems, hyperactivity, and attention deficits. These findings underscore the critical need for early detection of determinants and early signs of psychosocial problems. In the Netherlands, the Youth Healthcare Service (YHS) plays a vital role in the early detection of psychosocial problems in (early) adolescence. YHS provides routine preventive health care to all children aged 0-18 years, monitoring their physical, psychological, social, and cognitive development and identifying health and developmental issues at an early stage.

The Strengths and Difficulties Questionnaire (SDQ), one of the most widely used screening questionnaires[6,7], is utilized in conjunction with a screening interview to assess psychosocial problems. For early adolescents, the SDQ is filled out by parents. Despite evidence validating the SDQ's ability to detect psychosocial problems[8,9], recent scepticism has emerged within YHS regarding its screening abilities. Unlike the results of the HBSC study, data from periodic developmental assessment using the SDQ by the YHS in the Utrecht region show little increase in the detection of psychosocial problems compared to previous years, with percentages ranging from 7.7% in 2017 and 2019 to 8.2% in 2020.[10] This raised the question of whether the SDQ adequately captures the broader aspects of psychosocial functioning and whether the child's perspective is incorporated in a sufficiently standardized manner. This study aimed to investigate whether augmenting routine periodic developmental assessment, incorporating standardized well-being questions with smiley responses administered to children alongside the SDQ administered to parents, enhances the detection of psychosocial problems in this age group. Additionally, we sought to explore whether this screening method leads to the identification of different types of psychosocial problems.

Methods

Participants and data collection

Our study took place in Nieuwegein, the Netherlands. Nieuwegein falls within the working area of the YHS of the Municipal Health Service Utrecht. 22 primary schools located in Nieuwegein were divided into an intervention group and a control group. A power calculation using G*Power3 software showed that to obtain a 95% power, each group had to consist of at least 110 children. The allocation of schools was based on the student enrolments from the previous academic year and on whether a school was designated as an "attention school": a school with a higher percentage of children at risk for various problems. In Nieuwegein, eight attention schools were identified, and these schools were equitably distributed among the two groups based on student enrolments.

A total of 646 school-going children aged 10-12 years were invited to participate in the periodic developmental assessment from January 2023 till July 2023. The periodic developmental assessment is a standardized assessment for all children in seventh grade of primary school. Children receiving special education or whose parents did not consent to the assessment were excluded from the study.

The control group received the standard procedure for the periodic developmental assessment, which consists of a parent questionnaire; the SDQ parent version for children aged 7 to 11; and a non-standardized short screening interview with the child, conducted by a medical assistant. The parent questionnaire covers personal information like parental marital status, parental education, and parental employment, consent for the assessment and questions regarding the subthemes health, development, received care or support, vaccination status, life events, and financial status. At the end of the questionnaire, parents have the opportunity to ask additional questions.

The SDQ serves as a screening tool for psychosocial problems and comprises five subscales and an impact supplement. Each subscale (emotional problems, hyperactivity/inattention, peer problems, behavioural problems, and prosocial behaviour) consists of five questions requiring a response on a 3-point scale from not true to certainly true. The sum provides a subscore on

each subscale ranging from 0 to 10. A high score in prosocial behaviour reflects strengths, while high scores on other subscales indicate difficulties. The sum of subscores reflecting difficulties constitutes the total SDQ score, ranging from 0 to 40. The impact supplement contains items on overall distress and impairment, with questions regarding the degree and duration of problems experienced and the impact on functioning. These items can be summed to an impact score, ranging from 0 to 10.[6.,7]

The screening interview with the child is non-standardized; depending on the medical assistant, some questions are asked about school, friendships and mood. In the intervention group, instead of the non-standardized screening interview, medical assistants administered an oral well-being questionnaire to children, with questions regarding health, mood, self-confidence, home situation, stress, resilience, and social contacts. The questions are based on important determinants for mental health22 and are based on the 'happiness under pressure' study.12 The children had to answer the questions using a 5-point smiley scale ranging from 'very good' to 'very poor' (figure 1).

Figure 1: 5-point smiley scale

Anomalies in the periodic developmental assessment were defined as a total SDQ score of 11 or higher; a total score less than 11 but an elevated subscore or impact score of 2 or higher[11]; questions from parents regarding psychosocial problems; and/or anomalies in the screening interview (for the control group) or a child scoring 'neutral' to 'very poor' on at least one of the well-being questions (for the intervention group). In these cases, parents were contacted for a follow-up consultation by a youth health care professional, either by phone or in person, depending on the amount and severity of the detected anomalies.

After each follow-up consultation, the youth health care professionals answered five additional questions: whether the detection of psychosocial problems was deemed accurate; whether the child already received care or support for these problems; whether (additional) care or support was needed; what type of problems were identified; and whether additional care or support was implemented. The accuracy of detection was based on professional assessment; they assesses whether a psychosocial problem was indeed identifiable in the child. Data from the periodic developmental assessments and follow-up consultations were recorded in the YHS electronic health record. A researcher from the Municipal Health Service Utrecht extracted these data from the YHS electronic health record, along with sociodemographic characteristics including gender, age, gestational duration and country of birth.

Statistical Analysis

All statistical analyses were conducted using SPSS version 29. Baseline characteristics were analysed using the Chi-square test for categorical data and the paired sample t-test for age. In cases where expected cell counts were exceeded, the likelihood ratio was used instead of the Pearson chi-square. Logistic regression analyses were performed to assess differences in the detection of psychosocial problems between the two study groups, and to correct for possible confounding factors. Univariable analyses were performed for study group and for possible confounding factors. If a variable had a p-value below 0.1, this variable was added to a multivariable model. To detect differences in additional care or support, a chi-quare was used. Missing sociodemographic data were not imputed; analyses were based on available cases. Cases with missing SDQ scores were included in the analysis due to the clinical implications for screening mental health problems.

Ethical considerations

A data sharing agreement was established between UMC Utrecht and Municipal Health Service Utrecht for data provision. Data were anonymized by the Municipal Health Service, replacing names with non-traceable ID numbers. A data protection impact assessment concluded that participant informed consent and medical ethics review committee approval were not required.

Results

Baseline characteristics

Data were available for 542 children; 286 in the intervention group and 256 in the control group. Baseline characteristics (table 1) analysis revealed a slightly higher level of education for the second parent in the control group (p=0.044), with no other significant differences between the two groups.

Study flow

The flowchart (figure 2) illustrates the inclusion of children in the study, the detection of psychosocial

Table 1: Baseline characteristics

		Intervention group (n=286)	Control group (n=256)	p-value
Gender	Boys	138 (48.3%)	121 (47.3%)	0.863
	Girls	148 (51.7%)	135 (52.7%)	
Age (years)		11.45	11.47	0.611
Country of birth child	The Netherlands	268 (93.7%)	218 (92.6%)	0.768
	Western	4 (1.4%)	3 (1.2%)	
	Non-Western	14 (4.9%)	16 (6.3%)	
Country of birth parent 1	The Netherlands	227 (79.4%)	218 (73.2%)	0.140
	Western	7 (2.4%)	8 (3.1%)	
	Non-western	51 (17.8%)	63 (24.6%)	
	Unknown	1 (0.3%)	0 (0%)	
Country of birth parent 2	The Netherlands	218 (76.2%)	187 (73.0%)	0.062
	Western	10 (3.5%)	3 (1.2%)	
	Non-western	50 (17.5%)	60 (23.4%)	
	Unknown	8 (2.8%)	6 (2.3%)	
Marital status parent 1	Married	119 (41.6%)	95 (37.1%)	0.237
	Unmarried	8 (2.8%)	3 (1.2%)	
	Divorced	10 (3.5%)	11 (4.3%)	
	Partnership/cohabitation	85 (29.7%)	55 (21.5%)	
	Single	4 (1.4%)	8 (3.1%)	
	Unknown	60 (21.0%)**	84 (32.8%)**	
Marital status parent 2	Married	118 (41.3%)	95 (37.1%)	0.217
	Unmarried	8 (2.8%)	1 (0.4%)	
	Divorced	9 (3.1%)	10 (3.9%)	
	Partnership/cohabitation	84 (29.4%)	54 (21.1%)	
	Single	4 (1.4%)	4 (1.6%)	
	Widowed	1 (0.3%)	0 (0%)	
	Unknown	62 (21.7%)**	92 (35.9%)**	
Level of Educational parent 1*	Low	26 (9.1%)	28 (10.9%)	0.365
	Secondary	133 (46.5%)	103 (40.2%)	
	High	92 (32.1%)	90 (35.1%)	
	Unknown	35 (12.2%)	35 (13.7%)	
Level of Educational parent 2*	Low	49 (17.1%)	28 (10.9%)	**0.044**
	Secondary	121 (42.3%)	102 (39.8%)	
	High	76 (26.6%)	87 (34.0%)	
	Unknown	40 (14.0%)	39 (15.2%)	
Employment parent 1	Performs paid work	198 (69.2%)	173 (67.6%)	0.918
	Does not work	49 (17.1%)	46 (18.0%)	
	Unknown	39 (13.6%)	37 (14.5%)	
Employment parent 1	Performs paid work	224 (78.3%)	202 (79.5%)	0.959
	Does not work	16 (5.6%)	15 (5.9%)	
	Unknown	46 (16.1%)	39 (15.2%)	
Financial concerns	Never	188 (65.7%)	48 (16.1%)	0.539
	Sometimes	32 (11.2%)	6 (2.0%)	
	Always	2 (0.7%)	0 (0.0%)	
	Unknown	64 (22.4%)	202 (78.9%)	
Social security	No	243 (85.0%)	220 (85.9%)	0.458
	Yes, less than 3 years	10 (3.5%)	15 (5.9%)	
	Yes, longer than 3 years	5 (1.7%)	6 (2.3%)	
	Unknown	28 (9.8%)	15 (5.9%)	
Gestational age	A term	236 (82.5%)	212 (82.8%)	0.979
	Premature	11 (3.8%)	9 (3.5%)	
	Unknown	39 (13.6%)	35 (13.7%)	
Life events	None	211 (73,8%)	192 (75%)	0.619
	One	58 (20,3%)	55 (21,5%)	
	Two	13 (4,5%)	7 (2,7%)	
	Three or more	4 (1,4%)	2 (0,8%)	

* Lower education: primary education, VMBO, MBO level 1. Secondary: HAVO, VWO, MBO. High: HBO and scientific education

problems (periodic developmental assessment), and the professional assessment of the accuracy of detection (follow-up consultation). In the intervention group, a follow-up consultation was offered to 120 children (40.2%). In 89 children (31.1%) an additional follow-up consultation was completed, with an accurate detection in 79 children (27.6%). Of these 79 children, 47 (59.5%) had a normal SDQ score, and 9 (11.4%) had an incomplete SDQ questionnaire. In the control group, 27 children (10.5%) were offered an follow-up consultation and of these children, 11 children (40.7%) had a follow-up consultation, with accurate detection in 10 out of 11 cases (90.9%). In the control group, 24 children (88.9%) had an elevated SDQ score, and the remaining 3 children anomalies on the parent questionnaire.

Detection of psychosocial problems

The results of the regression analyses are summarized in table 4. In the univariable logistic regression analysis, a significant difference in the number of accurate detections was observed (OR 9.39, 95% CI 4.74 – 18.59) (Table 2). No significant difference in elevated SDQ scores between the two groups was found, ruling out the possibility of the SDQ being the reason for the difference. Country of birth of first parent, financial difficulties, and the number of life events had a p-value below 0.1 and were added to the multivariable model. In the multivariable model, children in the control group still had higher odds of accurate detection of psychosocial problems (aOR 11.71, 95% CI 2.62 – 52.37). The univariable analysis show a notable finding. Non-Western first parents show a significantly lower odds in the univariable analysis, OR 0,45 (95% CI 0,22 – 0,90) then parents born in the Netherlands.

Well-being questionnaire items

Among 120 children with abnormal answers on the well-being questionnaire, questions related to resilience (27.7%), self-confidence (22.5%), stress (17.8%), talking with parents (10.7%), and school (10.7%) were most frequently elevated.

Additional care and support

In the intervention group, 50.6% of children with accurately detected psychosocial problems already received care or support and 39.2% expressed an (additional) need for care or support. In the control group, 50% of children with accurately identified psychosocial problems already received care or support and 20% expressed an (additional) need for care or support. Additional care or support was implemented for 8.4% of children in the intervention group compared to 0.4% of children in the control group (P<0.001).

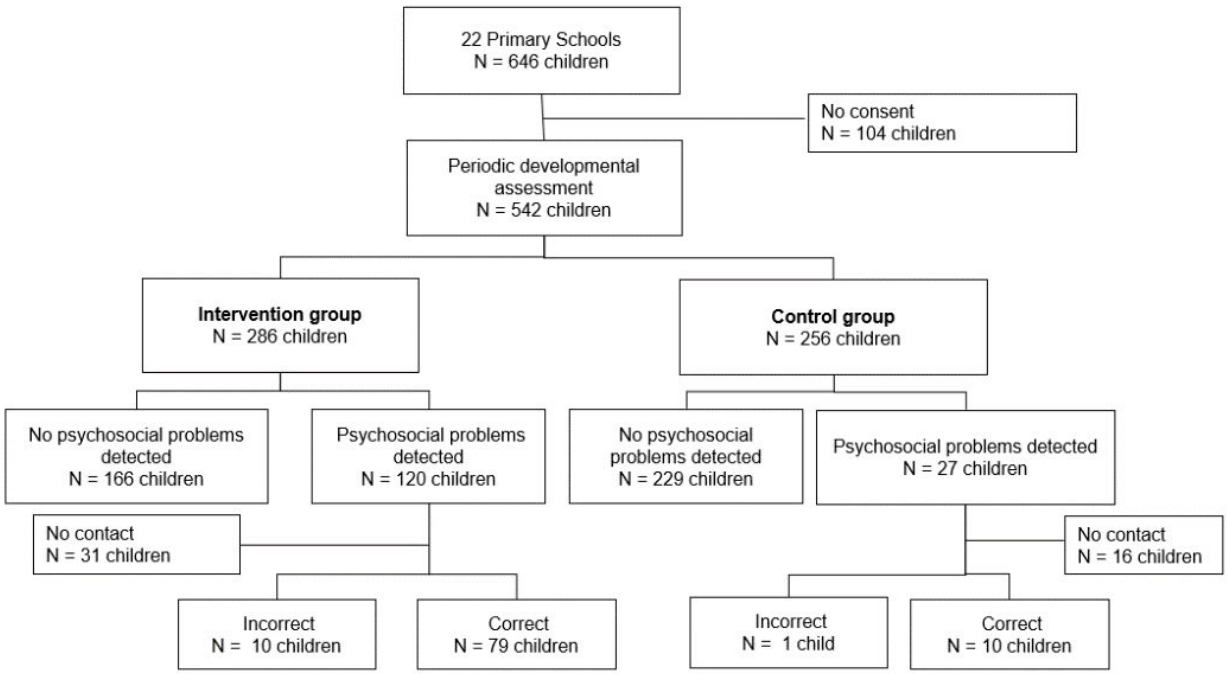

Figure 2: Flowchart of study enrolment and accurate detection of psychosocial problems

Table 2: Detection of psychosocial problems and the need for additional care or support			
	Intervention group N = 286 children	**Control group N = 256 children**	**P-value**
Additional consult	120 (42.0%)	27 (10.5%)	P < 0.001
Accurate detection	79 (27.6%)	10 (3.9%)	P < 0.001
Received additional care or support	40 (14.0%)	5 (2.0%)	P < 0.001
In need of additional care or support	31 (10.8%)	1 (0.4%)	P < 0.001

Table 3: SDQ scores			
	Intervention group N = 286 children	**Control group N = 256 children**	**P-value**
Normal	194 (67.8%)	197 (77.0%)	Not significant
Marginal Elevated	21 (7.3%)	18 (7.0%)	Not significant
Elevated	30 (10.5%)	24 (9.4%)	Not significant
Uncompleted	41 (14.3%)	17 (6.6%)	P<0.05

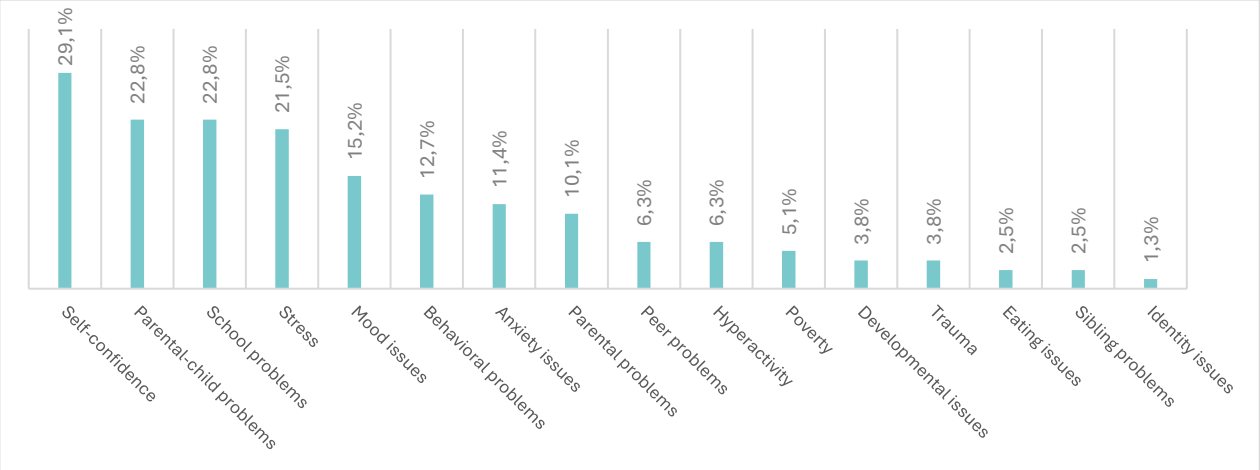

***Figure 2**: Detected types of psychosocial problems in the intervention group*

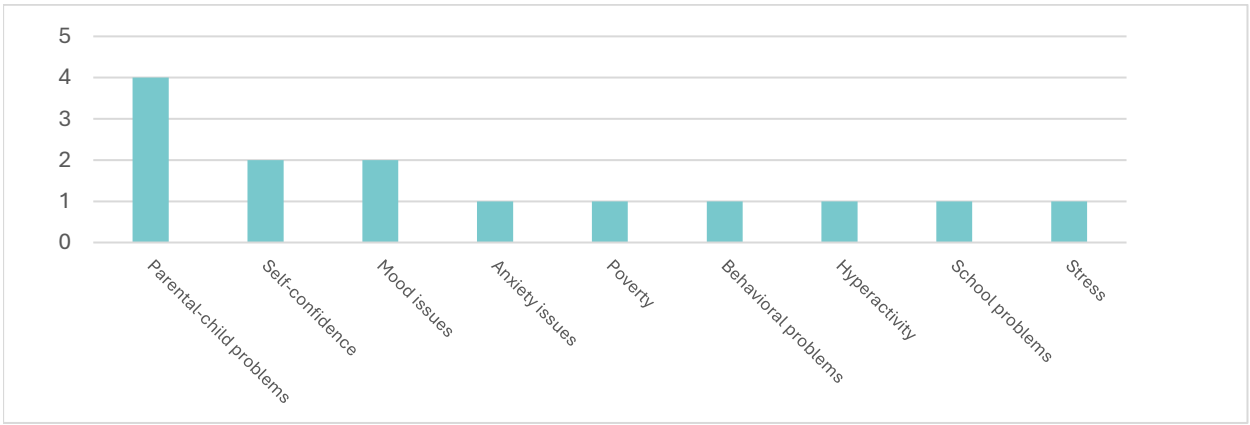

***Figure 4:** Detected types of psychosocial problems in the control group*

Types of psychosocial problems

Due to the low number of children with accurately detected psychosocial problems in the control group, comparative analyses could not be conducted. Figure 3 and 4 illustrates the identified types of psychosocial problems in the intervention group and control group. In the intervention group, problems with self-confidence, parent-child issues, school problems, stress issues, and mood problems were most frequently identified. In the control group, parent-child issues, self-confidence, and mood problems were the most frequent.

Table 4: Univariable and multivariable regression analyses

Variable	N	No problems N (%)	Psychosocial problems N (%)	Univariable OR (95% CI)	Multivariable aOR (95% CI)
Research groups					
Control group	256	246 (96.1%)	10 (3.9%)	Reference	Reference
Intervention group	286	207 (72.4%)	79 (27.6%)	**9.39 (4.74 – 18.59)**	**11.71 (2.62 – 52.37)**
Sex					
Boys	259	214 (82.6%)	45 (17.4%)	Reference	
Girls	283	239 (84.5%)	44 (15.5%)	0.88 (0.56 – 1.38)	
Country of birth Child					
The Netherlands	505	422 (83.6%)	83 (16.4%)	Reference	
Western	30	25 (83.3%)	5 (16.7%)	0.85 (0.10 – 7.13)	
Non-Western	7	6 (84.7%)	1 (14.3%)	1.02 (0.38 – 2.73)	
Country of birth Parent 1					
The Netherlands	412	339 (82.3%)	73 (17.7%)	Reference	Reference
Western	15	9 (60.0%)	6 (40.0%)	**3.10 (1.07 – 8.97)**	**5.98 (1.11 – 32.10)**
Non-Western	114	104 (91.2%)	10 (8.8%)	**0.45 (0.22 – 0.90)**	0.59 (0.25 – 1.36)
Country of birth Parent 1					
The Netherlands	405	335 (82.7%)	70 (17.3%)	Reference	
Western	13	10 (76.9%)	3 (23.1%)	1.44 (0.39 – 5.35)	
Non-Western	110	98 (89.1%)	12 (10.9%)	0.59 (0.831 – 1.13)	
Family					
Two parent family	365	298 (81.6%)	67 (18.4%)	Reference	
Single parent family	35	33 (94.3%)	2 (5.7%)	0.27 (0.06– 1.15)	
Level of education (P1)					
Highly-skilled	182	150 (82.4%)	32 (17.6%)	Reference	
Medium-skilled	236	200 (84.7%)	36 (15.3%)	0.84 (0.50 – 1.42)	
low-skilled	54	46 (85.2%)	8 (14.8%)	0.82 (0.35 – 1.89)	
Level of education (P2)					
Highly-skilled	163	139 (85.3%)	24 (14.7%)	Reference	
Medium-skilled	223	190 (85.2%)	33 (14.8%)	0.98 (1.01 – 0.57)	
low-skilled	77	60 (77.9%)	17 (22.1%)	1.64 (0.82 – 3.28)	
Financial difficulties					
No	236	183 (77.5%)	53 (22.5%)	Reference	Reference
Yes	40	24 (60.0%)	16 (40.0%)	**2.30 (1.14 – 4.65)**	**2.51 (1.14 – 5.51)**
Life events					
None	403	351 (87.1%)	52 (12.9%)	Reference	Reference
One	113	87 (77.0%)	26 (23.0%)	**02.02 (1.19 – 3.41)**	**2.78 (1.39 – 5.53)**
Two or more	26	15 (57.7%)	11 (42.3%)	**2.16 (0.09 – 11.37)**	**4.60 (1.60 – 13.21)**

Discussion

Key Findings

This study reveals a higher detection rate of psychosocial problems in the intervention group compared to the control group and a higher implementation of additional care or support in the intervention group. The well-being questionnaire indicated that questions regarding resilience, self-confidence, stress, talking with parents were mostly answered negatively. Due to the limited size of the control group, definitive conclusions could be drawn concerning the identified types of problems.

Interpretation

These outcomes strongly suggest that the implemented screening method, integrating the child's perspective in a standardized manner and adding more psychosocial factors, significantly amplifies the identification of psychosocial problems and enhanced the implementation of additional care or support. The prevalence of psychosocial problems of 27.6% in the intervention group is more in line with the prevalence in the Netherlands and global rates.[5,13,14]

The new screening method demonstrates that the use of the SDQ as the sole instrument for identifying psychosocial problems is insufficient, likely resulting in high false negatives. Previous SDQ studies in the Dutch population have generally validated its sufficiency for detecting psychosocial problems.[8,9] However, these studies based the validity upon the presence of psychopathology, neglecting the broader aspects of psychosocial functioning. Our results, consistent with the review of Kersten et al. (2016), raise concerns about the SDQ's validity, specifically its test-retest reliability, cultural and criterion validity, poor convergent validity of certain scales and sensitivity below 70% and specificity below 80%.[15] Therefore, caution is advised when considering the SDQ as the sole screening instrument for psychosocial problems.

An unexpected outcome is the lower odds for non-Western parents, contrary to earlier research showing a higher risk for psychosocial problems.[16] A possible explanation is that most screening instruments have been heavily influenced by the dominant Western biomedical model of mental health that assumes a universal set of causes and diagnostic categories.[17]

As far as we know, this study is the first to investigate the use of smileys in detecting psychosocial problems in children aged 10 to 12. Ge-Stadnyk (2023) suggests that the use of smileys and emojis in screening tools for identifying psychosocial problems could be promising due to their ability to assist in describing emotions.[18] Previous studies have shown positive results in detecting depressive symptoms using smileys in adults[19,20] and smileys have been effective in assessing the quality of life in children aged 4 to 7.[21]

Strengths and limitations

The strengths of our study lie in its timely response to a growing health concern, introducing an innovative methodology that combines standardized well-being questions with the traditional SDQ parent version. The study, characterized by a substantial sample size, a control group for comparative analysis and comparison to a well-established instrument (SDQ), enhances its overall validity. The practice-oriented approach provides immediate practical insights for early detection and treatment strategies.

Several limitations must be acknowledged. The absence of randomization poses a risk of selection bias, although efforts were made to allocate schools equitably based on previous academic year enrolment and attention school status. Baseline characteristics analysis indicates minimal selection bias. YHS data, not originally intended for research purposes, exhibits missing data, potentially affecting reliability and generalizability. Both groups underwent assessments by the same medical assistant in the same time period, introducing potential performance bias because of unintentional similarities in the questions the assistant posed to the control group, making them comparable to the intervention group. Observer bias may also impact study results, as certain data rely on professional judgment. There was a high loss of follow-up in both groups, particularly in the control group. The reason for this difference is unclear, but it is in line with practical observations.

Implications for practice and future research

Our findings have noteworthy implications for clinical practice and future research. The introduced screening method, incorporating the child's perspective in a standardized manner and expanding the focus to broader psychosocial aspects, offers a promising, simple tool for early detection of psychosocial problems, potentially facilitating more timely interventions.

This study demonstrated a initial effect, however, subsequent research is imperative to validate the effectiveness and reliability of the well-being questionnaire as a screening tool. We recommend a study design with a larger research population, involving multiple municipalities, randomization, and the use of research-appropriate data.

Conclusion

Integrating a well-being questionnaire with smiley responses into routine developmental assessments leads to increased detection of psychosocial problems in children aged 10 to 12. By incorporating the child's perspective in a standardized manner and considering a broader spectrum of psychosocial factors, this screening method enhances timely implementation of care or support, potentially reducing the risk of psychosocial problems later in life.

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