Known groups validity of the SPARK36: To guide nurse-led consultations for the early detection of child developmental and parenting problems

Ann Keymeulen¹,² | Ingrid I. E. Staal³,⁴ | Marlou L. A. de Kroon⁵,⁶ | Theo van Achterberg²

¹Flemish Scientific Society for Youth Health Care, Leuven, Belgium
²Department of Public Health and Primary Care, Academic Centre for Nursing and Midwifery, University of Leuven, KU Leuven, Leuven, Belgium
³Preventive Child Health Care, Municipal Health Service Zeeland, Goes, The Netherlands
⁴Dutch Knowledge Centre for Youth Health, NCJ, Utrecht, The Netherlands
⁵Department of Public Health and Primary Care, Environment and Health, Youth Health Care, University of Leuven, KU Leuven, Leuven, Belgium
⁶Department of Health Sciences, Environment and Health, Youth Health Care, University Medical Centre Groningen, University of Groningen, Groningen, The Netherlands

Correspondence
Ann Keymeulen, Flemish Scientific Association for Youth Health Care, Tervuursevest 242C, 3000 Leuven, Belgium.
Email: keymeulenann@hotmail.be

Funding information
Vlaamse regering, Grant/Award Number: VR2020 130 DOC BHOV VWVJ

Abstract

Aim: Early detection of child developmental and parenting problems is important for timely prevention. The SPARK36 (Structured Problem Analysis of Raising Kids aged 36 months) is a novel broad-scope structured interview guide aimed at assessing parenting concerns and needs for support for child developmental and parenting problems, using the parental and professional’s (Youth Health Care nurses) perspective. The applicability of the SPARK36 in practice was already demonstrated. Our aim was to evaluate its known groups validity.

Design/Methods: SPARK36 data were collected in a cross-sectional study in 2020–2021. The known groups validity was assessed by testing two hypotheses: the SPARK36 risk assessment shows a higher risk of parenting and child developmental problems in children (1) from parents with a lower socioeconomic status and (2) from families with ≥4 risk factors for child maltreatment. To test the hypotheses, Fisher’s exact tests were applied.

Results: In total, 29 Youth Health Care nurses from four School Health Services performed SPARK36-led consultations with 599 parent–child pairs to assess the risk for child developmental and parenting problems. Both hypotheses were accepted at a significant p level.

Conclusion: The results of the known groups validity support the hypothesis that the SPARK36 risk assessment for child developmental and parenting problems is carried out in a valid way. Future research is needed to assess other aspects of the validity and reliability of the SPARK36.

Impact: This is a first step in validating the instrument for use during a nurse-led consultation with parents of 3-year-olds in Flemish School Health Services. Thereby, SPARK36 supports the nurses in accomplishing their assignment, making a risk assessment, and contributes to quality of care.

Patient or Public Contribution: This study aimed to evaluate the known groups validity of the SPARK36. Therefore, it was not conducted using input from the public or the patient population.
1 | INTRODUCTION

The first years of life are an important window of opportunity for early child development, which is heavily influenced by the environment and experiences one accumulates from birth onwards (Chong et al., 2017). Young children require substantial support from their caregivers to develop a broad array of behaviours and social skills, which form the foundation for all other aspects of children’s functioning, including forming good health habits, meaningful relationships and friendships, and successfully adapting to school, family and community life (Huang et al., 2018). Parenting is a critical social factor in child development here, which includes many practical considerations, psychological concepts and cultural norms (Neel et al., 2018; Shah et al., 2013; Treyvaud et al., 2016). Parenting has three essential dimensions: (1) providing care that protects children from harm that includes boundaries for the safety of the child and others, (2) parent–child interactions that support developmental, emotional and physical health and (3) enhancing a child’s potential by helping parents to learn parenting strategies that facilitate effective growth and development (Vance & Brandon, 2017). Negative parenting practices are key modifiable risk factors for child behaviour problems (Brenner & Fox, 1998; Cowan et al., 1994; Gulenc et al., 2018).

It is important to identify and address (the risk of) emerging developmental and behavioural difficulties as well as parenting problems at an early stage because many of these have an adverse impact on health and participation in childhood and throughout the course of life (Gulenc et al., 2018; Klein Velderman et al., 2007; Oberklaid et al., 2013). To prevent physical and mental illnesses later in life, Youth Health Care (YHC) in Europe is committed to detecting and reducing chronic or severe stress during childhood development, referred to as Early Life Stress (EUSUHM, 2019). Research shows that adverse life exposures (i.e. adverse childhood experiences), such as poor feeding and poverty (Roseboom, 2018), child abuse and neglect (Shonkoff et al., 2012), physical and mental illnesses in parents (Morrow & Villodas, 2018; Smyth, 1999), and lower childhood socioeconomic position (Walsh et al., 2019), are recognized as factors related to Early Life Stress (Fearon et al., 2016; Kok et al., 2015; Turecki & Meaney, 2016).

Currently, the benefits of early identification of developmental and behavioural problems in young children, problems in parenting and subsequent entry into early intervention services have been well documented (AAP, 2001; Bergman, 2004; Filipke et al., 2000; Hermanns et al., 2005; Oberklaid et al., 2013; Reynolds et al., 2007; Wagner et al., 2006). Subsequently, screening for early detection of developmental, behavioural and parenting problems is preferably carried out using a valid instrument (Bergman, 2004; Glascoe, 2005; Klein Velderman et al., 2007; van Stel et al., 2012; Vogels et al., 2003).

Furthermore, parents’ concerns can be used to accurately detect and address problems (Glascoe & Marks, 2011; Lepistö et al., 2022).

2 | BACKGROUND

Regular checks on every child’s health and development at various ages is an attractive concept. It was the rationale for the introduction of screening protocols in YHC (Lindsay & Wedell, 1982). In Flanders, these regular consultations are organized by the ‘well-baby clinics’ of the Child and Family Services for children up to the age of 3 years (Hoppenbrouwers et al., 2010), and by the School Health Services (SHS) for children aged from 3 to 18 years (Vlaams Parlement, 2018a). Since the implementation of new legislation on SHS in Flanders in 2018, all children and their parents are invited for a preventative consultation in the first year of nursery school (Age 3). During this consultation, the YHC professional (nurse) listens to the parents’ concerns, provides aftercare based on the assessed parental needs and the risk of problems in child development and parenting. In the absence of an available (valid) instrument to guide the conversation with the parent, a broad-scope structured interview was developed, named the ‘Structured Problem Analysis of Raising Kids aged 36 months’ (SPARK36). The SPARK36 is adapted from similar instruments for different age groups (SPARK18 and SPARK60). SPARK18, designed for the age of 18 months, is an instrument which had already been validated in the Netherlands (Staal et al., 2011; van Stel et al., 2012). Consequently, new SPARKs were developed for the age of 60 months (SPARK60), as well as for use during pregnancy (PreSPARK) (van Driessche et al., 2021). A previous study demonstrated that using the SPARK36 is feasible in daily practice (Keymeulen et al., 2021), but the instrument has not been validated yet.

3 | STUDY

In the absence of a gold standard for assessing the risk of parenting and developmental problems at the age of 36 months, the purpose of the study was to evaluate the SPARK36’s construct validity by testing the known groups validity (Netemeye et al., 2003).

3.1 | Evaluating known groups validity

Two hypotheses were identified a priori, based on evidence from relevant literature, to determine known groups validity. The first hypothesis was that assessment with the SPARK36 shows a higher risk of parenting and child developmental problems in children of parents with lower socioeconomic status (SES). For
testing our first hypothesis, we focus on low educational background of the parents, unemployment and receiving school allowance as operationalizations of low SES (Reiss et al., 2019; Shavers, 2007; van den Branden et al., 2014).

Families with low SES are at risk in multiple ways and suffer from a higher number of stressors related to finances, social relations, employment situations and health complaints than those with high SES (Senn et al., 2014; Weyers et al., 2010), resulting in an increased risk of parenting and child developmental problems. These socioeconomic inequalities affect not only parents’ but also children’s lives. For instance, children in families with low SES often experience more barriers in accessing education and social participation than their peers with high SES (Engels & Thielebein, 2011). Moreover, children in families with low SES suffer more from health problems than children in families with high SES (Vukojevic et al., 2017). Further, children and adolescents in families with low SES are at an increased risk of suffering from multiple stressful life situations and of developing mental health problems (Reiss et al., 2019). Additionally, lower SES in families is associated with a higher risk of ACEs and child maltreatment (Walsh et al., 2019).

The second hypothesis was that assessment with the SPARK36 shows a higher risk of parenting and child developmental problems in children of families with four or more risk factors for child maltreatment. Child maltreatment, an extreme form of adverse parenting, is a major public health problem that is associated with severe mental and physical health and developmental consequences for children. Child maltreatment is associated with physical injury, growth retardation, obesity, anxiety, depression, post-traumatic stress disorder and long-term deficits in educational achievement (Felitti et al., 1998; Gilbert et al., 2009). Moreover, the most important risk factors for child maltreatment appear to be those that are purely related to the parent(s) or caregiver(s) (Mulder et al., 2018), for example, their educational level or income, their ethnicity and use of the local language and the size of their family (Assink et al., 2016; Mulder et al., 2018; Staal et al., 2013; Vermeulen et al., 2021; Vink et al., 2016). Finally, preterm birth (<37 weeks gestational age) and low birth weight (<2500 g) are well-documented risk factors for a variety of developmental problems related to health, psychological adjustment and intellectual functioning (Cepeda et al., 2007; Morse et al., 2009; Raznahan et al., 2012). Also, some studies have shown an association between prematurity or low birth weight and maltreatment (Browne & Saqi, 1988; Creighton, 1992; Sidebotham et al., 2006; Wu et al., 2004), although these results were not contradictory (Brown et al., 1998; Leventhal et al., 1984). A number of consequences may underlie this association, including effects on child behaviour, parent–child bonding, and potential increased stress (Sidebotham et al., 2006). In conclusion, for testing the second hypothesis relating to risk factors for child maltreatment, we focused on low educational background of parents, unemployment of parents, receiving school allowance, being from a large family (>4 children), being a single parent family, parents with non-Belgian ethnicity, having parents who do not speak Dutch at home and adverse birth outcomes (low birth weight, i.e., <2500 g and/or low gestational age [<37 weeks]) (Assink et al., 2016; Staal et al., 2013; Vermeulen et al., 2021; Vink et al., 2016).

The choice of four or more risk factors was based on the cumulative risk model, which assumes that health outcomes are determined by the accumulation of risk factors, independently of the exact combination of risk factors (Appleyard et al., 2005; Rutter, 1979; Sameroff et al., 1987, 1993). The number of risk factors is a more efficient and accurate predictor than a single risk factor (Glascoe, 2005; Hermanns et al., 2005; Lamela & Figueiredo, 2018).

4 | METHODS

4.1 | Design

The known groups validity was evaluated cross-sectionally based on data collected in the school year 2020–2021.

4.2 | Sampling method

Between June 2020 and August 2020, teams of YHC nurses in SHS across Flanders were recruited. An invitation letter was sent out by the Flemish Scientific Society for YHC to all 56 SHS in Flanders. The following preconditions were defined: (1) per SHS, the whole team of YHC nurses would be trained to use the SPARK36, (2) the YHC nurses would use the SPARK36 in 10 consultations during the training period. The period included three training sessions of 2.5 h each and focused on the correct use of the instrument and (3) after the training period, the YHC nurses were asked to use the SPARK36 in 30 consultations.

Nurses were instructed to organize SPARK36-led consultations in schools selected by the researcher, to have a mixed and representative study group. The schools were selected with a view to diversity in the average Social Economic Status (SES) score of the school-going children and their parents, provided by the Flemish Government (Vlaamse overheid, 2021).

4.3 | Data collection

Data collection commenced after completing a training period in January 2021 until August 2021.

Using the SPARK36 instrument, we collected data on demographics and background characteristics (including indicators for SES and risk factors for child maltreatment), parents’ concerns, parents’ perceived need of support, professional assessment of perceived need of support and an overall risk assessment.

4.4 | SPARK

The SPARK is a method that consists of a structured dialogue with the parent(s) on 16 domains covering the child, the family and the
child-rearing environment. The SPARK method and structure are the same for every SPARK (PRE-SPARK, SPARK18, SPARK36 and SPARK60). Every SPARK has its own relevant domains and examples based on the age of the child. Further, the SPARK36 has been adapted to the Flemish context. The SPARK uses a three-step model. Step 1: detection of problems and concerns of the parents; step 2: clarifying the characteristics and impact of problems and concerns in dialogue with the parents and discussing the need for parental support; step 3: analysis and a shared decision of parents and nurse on what to do next. At the end of the consultation, the YHC nurse makes an overall risk assessment, divided into low, increased or high risk for parenting and child developmental problems. The YHC nurse bases this overall risk assessment on the information from the dialogue, the biomedical tests and the observed interaction between child and parent(s) (Staal et al., 2013).

4.4.1 | Parents' concerns and perceived need of support

For each domain, the YHC nurse starts with a short description of the domain with examples, then the parents are invited to talk about their experience in that domain, and then the YHC nurse asks whether they have experienced any questions, concerns or problems in the last 6 months. After they have shared their experiences, they are asked to assess the seriousness of concerns on a five-point Likert scale ranging from 'no concerns at all' to 'very concerned' (step 1). If any concerns are cited, solution-oriented questions are asked to elaborate upon the exact nature of any questions, concerns or problems, and whether or not informal and/or professional help—if offered—has been sufficient. Each domain ends with the parents assessing their current perceived need for support, on a six-point Likert scale from (1) no help needed, (2) information wanted, (3) personal advice, (4) counselling, (5) intensive help to (6) immediate intervention required. The YHC nurse makes the same assessment using the same scale (step 2). After all the domains have been surveyed in this structured manner, the similarities and differences between the parents and the YHC nurse are used to jointly make follow-up appointments for the coming period (step 3) (van Stel et al., 2012).

4.4.2 | Risk assessment

The risk outcome based on the assessment with the SPARK36 is categorized into low, increased and high risk. Low risk is defined as a balanced situation in which there is a favourable living environment for the child's development in physical, cognitive and social–emotional terms; increased risk is defined as a situation that requires greater parental capabilities to achieve healthy child development on a physical, cognitive and social–emotional level; and high risk is defined as a situation in which the parenting burden and capabilities are out of balance, which may result in a threat to the child's development on a physical, cognitive and social–emotional level. If increased risk is assessed, extra support from the SHS is desirable and will be offered. If there is a high risk, the parenting burden and capabilities are out of balance to such an extent that the corresponding necessary care requires support from a curative setting.

4.4.3 | Demographic data

Demographic data, including SES indicators and risk factors for child maltreatment, were surveyed from the parents during the consultation and registered on the SPARK36 form.

SES was measured using three different indicators: parental education level, parental employment status and receiving school allowance. Education was defined by the highest educational level attained by the parents (Lepe et al., 2021, which was categorized into low, intermediate and high (Shavers, 2007; van den Branden et al., 2014). Employment status was defined as the current employment status. The employment status was coded as 'employed' or 'unemployed' (which also includes the answer options 'studying' and 'stay-at-home') if both parents were unemployed (Al-Bakri et al., 2022). For education status, the highest level from either parent was used (Lepe et al., 2021). In the event of a single-parent family, data from that parent were used. Receiving school allowance is based on the household income (Vlaams Parlement, 2018b) and was indicated by the parent by selecting 'yes' (receiving school allowance) or 'no'.

The risk factors for child maltreatment were measured using the following indicators: low educational background of mother, low educational background of father, unemployment of mother, unemployment of father, receiving school allowance, being from a large family (≥4 children), being from a single parent family, mother with non-Belgian ethnicity, father with non-Belgian ethnicity, having a mother who does not speak Dutch at home, having a father who does not speak Dutch at home, low birth weight (<2500 g) and low gestational age (<37 weeks). Educational background, employment status and receiving school allowance were categorized as described above. Family composition was categorized into ‘two-parent household’, ‘single-parent household’ or ‘others’. Ethnicity was categorized into ‘Belgian’ and ‘non-Belgian’. Language used at home was categorized into ‘Dutch-speaking’ and ‘non-Dutch-speaking’. Birth weight was categorised into ‘<2500 g’ and ‘≥2500 g’. Gestational age was categorized into three categories: ‘<32 weeks’, ‘32–36 weeks’ and ‘≥37 weeks’. Family size was measured by asking the number of children in the family.

4.5 | Data analysis

Descriptive statistics were used to describe the data on: demographics, parents’ concerns, perceived needs of support and overall risk assessment. To analyse the differences between groups with expected differences and the overall risk assessment, Fisher’s exact tests were applied. Based on a significant p-value (p < .05), the
hypothesis was accepted. The phi coefficient was used to explore effect sizes. Hypotheses were tested as follows:

For hypothesis 1, the association between the individual risk factors for SES and the overall risk assessment was explored, using a Fisher’s exact test.

For hypothesis 2, a ‘known risk factors summary score’ was calculated by summing the presence of the risk factors for child maltreatment. A high risk of child maltreatment risk was defined as having four or more present risk factors, and a low risk of child maltreatment as having 0 to 3 risk factors. A Fisher’s exact test was used to explore the association between the ‘at-risk group’ and the overall risk assessment. Data analysis was performed using SPSS version 26. A $p$-value below .05 was considered statistically significant.

### 4.6 Ethics

Parents’ consent was obtained by the nurses. At the end of the consultation, the study purpose was explained to them (orally and in writing), after which they were asked to give consent for using all information collected through the use of SPARK36.

## 5 RESULTS

### 5.1 Participation by School Health Service centres (SHS)

Five SHSs across Flanders met the preconditions and responded to the invitation letter. At the beginning of the training, 49 YHC nurses started the training session. As a consequence of the COVID-19 pandemic, there was a dropout of 20 YHC nurses, implying that in total, 29 YHC nurses collected data for the study purpose. Moreover, 20 nurses selected schools on the basis of convenience instead of random selection. The remaining nine nurses followed the instructions to organize SPARK36-led consultations in schools selected by the researcher. The number of consultations supported with SPARK36 per YHC nurse varied between 1 and 60.

### 5.2 Characteristics of children, parents and family

Data from 599 consultations of in total 629 supported by SPARK36 were included in the study. In 30 of the 629 cases, the parent(s) did not give consent for using any information for study purposes. Table 1 gives an overview of the background and consultation characteristics.

### Table 1 Background and consultation characteristics ($n=599$).

<table>
<thead>
<tr>
<th>Consultation</th>
<th>Total n (%)</th>
<th>Low n (%)</th>
<th>Increased n (%)</th>
<th>High n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presence of</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mother</td>
<td>444 (74.7)</td>
<td>376 (84.7)</td>
<td>60 (13.5)</td>
<td>8 (1.8)</td>
</tr>
<tr>
<td>Father</td>
<td>109 (18.4)</td>
<td>92 (84.4)</td>
<td>17 (15.6)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>Both father and mother</td>
<td>34 (5.7)</td>
<td>23 (73.5)</td>
<td>9 (26.5)</td>
<td>2 (5.9)</td>
</tr>
<tr>
<td>Others</td>
<td>7 (1.2)</td>
<td>4 (57.1)</td>
<td>3 (42.9)</td>
<td>0 (0.0)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Child characteristics</th>
<th>Total n (%)</th>
<th>Low n (%)</th>
<th>Increased n (%)</th>
<th>High n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>316 (53.4)</td>
<td>250 (79.1)</td>
<td>58 (18.4)</td>
<td>8 (2.5)</td>
</tr>
<tr>
<td>Female</td>
<td>276 (46.6)</td>
<td>242 (87.7)</td>
<td>31 (11.2)</td>
<td>3 (1.1)</td>
</tr>
<tr>
<td>Gestational age: &lt;37 Weeks</td>
<td>47 (8.2)</td>
<td>37 (78.7)</td>
<td>7 (14.9)</td>
<td>3 (6.4)</td>
</tr>
<tr>
<td>Birth weight: &lt;2500 g</td>
<td>32 (5.6)</td>
<td>23 (71.9)</td>
<td>8 (25.0)</td>
<td>1 (3.1)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Family characteristics</th>
<th>Total n (%)</th>
<th>Low n (%)</th>
<th>Increased n (%)</th>
<th>High n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>One-parent household</td>
<td>42 (7.2)</td>
<td>22 (52.4)</td>
<td>19 (45.2)</td>
<td>1 (2.4)</td>
</tr>
<tr>
<td>≤4 children in the family present during the consultation</td>
<td>64 (10.7)</td>
<td>48 (75.0)</td>
<td>15 (23.4)</td>
<td>1 (1.6)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(Biological) Parent characteristics</th>
<th>Total n (%)</th>
<th>Low n (%)</th>
<th>Increased n (%)</th>
<th>High n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-educated parents</td>
<td>37 (6.5)</td>
<td>27 (73.0)</td>
<td>8 (21.6)</td>
<td>2 (5.4)</td>
</tr>
<tr>
<td>Unemployed parents</td>
<td>17 (2.9)</td>
<td>8 (47.1)</td>
<td>9 (52.9)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>Receiving school allowance</td>
<td>112 (20.3)</td>
<td>78 (69.6)</td>
<td>31 (27.7)</td>
<td>3 (2.7)</td>
</tr>
<tr>
<td>Ethnicity: non-Belgian parents</td>
<td>187 (33.9)</td>
<td>148 (79.1)</td>
<td>36 (19.3)</td>
<td>3 (1.6)</td>
</tr>
<tr>
<td>Language: non-Dutch used at home by the parents</td>
<td>276 (46.8)</td>
<td>227 (83.4)</td>
<td>46 (14.7)</td>
<td>3 (1.9)</td>
</tr>
</tbody>
</table>
characteristics. It shows that during the interviews, the mothers of the 3-year-olds were most often present (74.7%), while fathers were present in 18.4% of the cases. It also shows the numbers and percentages of the risk factors used for defining low SES and high risk of child maltreatment to test both hypotheses.

### 5.3 SPARK36 descriptive analyses

Table 2 shows that parents were most often (very) concerned about the domains: 'somatic health' (4.8%), 'toddler period and transition to preschool' (4.0%) and 'family issues' (2.8%). Domains with the highest level of support needed (i.e. intensive help/immediate intervention required), as assessed by the parent, were 'language, speech and thought' (1.3%), 'living environment' (0.9%), 'family issues' (0.7%) and 'parenting approach' (0.7%). For the nurses, these were 'language, speech, and thought' (1.5%), 'emotional development' (0.9%), 'child behaviour' (0.9%) and 'concerns communicated by others' (0.9%).

The overall risk assessment performed by the YHC nurses resulted in 499 (83.3%) children considered to be at low risk, 89 (14.9%) at increased risk and 11 (1.8%) at high risk for developmental and parenting problems.

### 5.4 Known groups validity

The results of the Fisher’s exact tests to evaluate the SPARK36’s known groups validity are presented in Table 3. Based on the results of the statistical analyses, the two hypotheses are accepted, meaning that assessment with the SPARK36 shows a higher risk of parenting and child developmental problems (1) in children of parents with lower SES and (2) in families with four or more risk factors for child maltreatment present (p < .05). The

<table>
<thead>
<tr>
<th>TABLE 2 Parents’ concerns, and support needs as perceived by nurses and parents, for each SPARK36 domain (N = 599).</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SPARK36 domains</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Toddler period and transition to preschool</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Health and development</td>
</tr>
<tr>
<td>Somatic health</td>
</tr>
<tr>
<td>Motor development</td>
</tr>
<tr>
<td>Language, speech and thought development</td>
</tr>
<tr>
<td>Language use of parents</td>
</tr>
<tr>
<td>Emotional development</td>
</tr>
<tr>
<td>Child–parent interaction</td>
</tr>
<tr>
<td>Child behaviour</td>
</tr>
<tr>
<td>Contact between child and others</td>
</tr>
<tr>
<td>Parenting approach</td>
</tr>
<tr>
<td>Development stimulation and educational preparation</td>
</tr>
<tr>
<td>School and day-care</td>
</tr>
<tr>
<td>Time-spending</td>
</tr>
<tr>
<td>Family and environment</td>
</tr>
<tr>
<td>Living environment</td>
</tr>
<tr>
<td>Social contacts and informal support</td>
</tr>
<tr>
<td>Concerns communicated by others</td>
</tr>
<tr>
<td>Family issues</td>
</tr>
</tbody>
</table>

aThe 5-point assessment of parents was dichotomised for readability; categories for ‘no concerns’ were omitted.

bThe 6-point assessment of parents and professional were dichotomised for readability; the category for ‘no help needed’ was omitted.
TABLE 3 Statistical testing of the two hypotheses on known groups validity (N = 599).

<table>
<thead>
<tr>
<th>Overall risk assessment</th>
<th>Low n (%)</th>
<th>Increased n (%)</th>
<th>High n (%)</th>
<th>p-value</th>
<th>Hypothesis accepted/rejected</th>
<th>Effect size (phi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesis 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educational background of parents (n = 569)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low level (6.5%)</td>
<td>27 (73.0)</td>
<td>8 (21.6)</td>
<td>2 (5.4)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intermediate (28.5%)</td>
<td>113 (70.4)</td>
<td>45 (27.7)</td>
<td>3 (1.9)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High level (65.0%)</td>
<td>329 (89.5)</td>
<td>33 (8.9)</td>
<td>6 (1.6)</td>
<td>.001</td>
<td>Accepted</td>
<td>0.25</td>
</tr>
<tr>
<td>Parents’ employment status (n = 588)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployed (2.9%)</td>
<td>8 (47.1)</td>
<td>9 (52.9)</td>
<td>0 (0.0)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed (97.1%)</td>
<td>478 (84.2)</td>
<td>79 (13.9)</td>
<td>11 (1.9)</td>
<td>.001</td>
<td>Accepted</td>
<td>0.18</td>
</tr>
<tr>
<td>School allowance (n = 548)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Receiving (20.3%)</td>
<td>77 (69.6)</td>
<td>31 (27.7)</td>
<td>3 (2.7)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not receiving (79.7%)</td>
<td>380 (87.0)</td>
<td>49 (11.2)</td>
<td>8 (1.8)</td>
<td>.001</td>
<td>Accepted</td>
<td>0.19</td>
</tr>
<tr>
<td>Hypothesis 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of risk factors for child maltreatment* (n = 475)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;4 RF (70.7%)</td>
<td>300 (89.3)</td>
<td>30 (8.9)</td>
<td>6 (1.8)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥4 RF (29.3%)</td>
<td>102 (73.4)</td>
<td>34 (24.5)</td>
<td>3 (2.1)</td>
<td>.001</td>
<td>Accepted</td>
<td>0.20</td>
</tr>
</tbody>
</table>

*Low educational background of parents, unemployment of parents, receiving school allowance, being a large family (≥4 children), being a single-parent family, parents with non-Belgian ethnicity, having parents who do not speak Dutch at home and adverse birth outcomes (low birth weight (<2500 g) and/or low gestational age (<37 weeks)).

The effect size ranged from 0.18 to 0.25, which is considered small (Cohen, 1992).

6 | DISCUSSION

In this study, we evaluated the known groups validity of the SPARK36, a structured interview for the assessment of parenting and developmental problems in 3-year-olds in Flanders. Based on the literature, two hypotheses were formulated. The first hypothesis was that SPARK36 risk assessment would show a higher risk of parenting and child developmental problems in children of parents with lower SES. The second hypothesis was that SPARK36-informed risk assessment would show a higher risk of parenting and child developmental problems in children of families with four or more risk factors present for child maltreatment. Both hypotheses were tested, and both were accepted.

The hypotheses were accepted based on the criterion of statistical significance; all p-values were lower than .001. However, explorations of effect size indicated that relationships were not very strong. There are a few possible explanations for this. First, being a child of parents with low SES or a child of a family with four or more risk factors for child maltreatment does not automatically mean that there is an increased or high risk of problems. Protective factors (e.g. a good social network, or other environmental factors like a green living environment) (Vink et al., 2016) can also play a role, which were not taken into account, implying that a perfect correlation was not to be expected. Second, in 124 of our 599 cases, data on one or more (out of 13) risk factors for child maltreatment was missing. These missing values probably imply that we may have missed several cases where four or more risk factors were present, due to incompleteness of the data. Thus, a certain degree of misclassification could have led to lower effect sizes. Third, specifically for the hypothesis on child maltreatment, the SPARK method is aimed at problems in child developmental and parenting in general; it was not specifically developed to measure the risk of child maltreatment (Staal et al., 2013). Thus, the broad-scope perspective could have reduced the effect size.

The study had several limitations. The first limitation relates to the fact that the study was conducted during the COVID-19 period. Because YHC nurses played an active role in contact-tracing for infected children in schools, they were not always able to perform their core tasks. This also impacted the study. Out of 49 YHC nurses, 20 ceased their participation before data collection started, thus resulting in a smaller sample of children than anticipated. Besides this, not all the nurses collected data for 30 SPARK36-led consultations as initially agreed upon, which also contributed to a smaller sample size. As a second limitation, the sample is not fully representative of the Flemish population. In Flanders, the proportions of adults between 25 and 64 years old with lower, intermediate and higher education are 15.9%, 38.7% and 45.4% respectively (Vlaamse overheid, 2022) as compared to 6.5%, 28.5% and 65% in this sample. The proportion of children in nursery school who receive school allowance is 37.9%. In our sample, 20.3% of 3-year-olds received school allowance. Furthermore, both parents are unemployed in 3.6% of Flemish families with 3- to 6-year-olds (Vlaamse overheid, n.d.), whereas in our sample, this was 2.9%. These percentages indicate that our sample was relatively more privileged and not fully representative of
the Flemish population. A possible explanation for this is that the instructions on random selection were not followed by 20 YHC nurses out of the 29 YHC nurses. Despite the limitations, that is, the small sample size and the insufficient representativeness of the population, the expected differences were detected by working with the SPARK36 instrument.

7 | CONCLUSION

In conclusion, these findings provide support for the SPARK36's validity as an instrument to identify children with increased risk for developmental and parenting problems. However, further research is needed to assess other aspects of validity and reliability of the instrument.

It is a first step in validating the instrument for use during a nurse-led consultation with parents of 3-year-olds in Flemish school health services. Thereby, SPARK36 supports the nurses in accomplishing their assignment, making a risk assessment, and contributes to quality of care.

AUTHOR CONTRIBUTIONS

All authors have agreed on the final version and meet at least one of the following criteria (recommended by the ICMJE): (1) substantial contributions to conception and design, acquisition of data or analysis and interpretation of data; (2) drafting the article or revising it critically for important intellectual content.

ACKNOWLEDGEMENTS

The authors would like to thank the YHC nurses for their contribution to the study, especially during the pandemic. This study is supported by the Flemish Government (Project number VR2020 130 DOC BHOV VWVJ).

FUNDING INFORMATION

The study has been funded by the Flemish government, Project number VR2020 130 DOC BHOV VWVJ. The Flemish government had no role in any part of the study.

CONFLICT OF INTEREST STATEMENT

The authors have no conflicts of interest to declare that are relevant to the content of this article.

PEER REVIEW

The peer review history for this article is available at https://www.webofscience.com/api/gateway/wos/peer-review/10.1111/jan.15711.

DATA AVAILABILITY STATEMENT

This study was approved by the university ethics committee. Due to privacy and ethical restriction, the data are not publicly available, but will be made available upon reasonable request made to the corresponding author.

ETHICS STATEMENT

The study was approved by the Ethics Committee for Research at UZ/KU Leuven (S62262). Informed consent was obtained from all individual participants included in the study.

ORCID

Ann Keymeulen https://orcid.org/0000-0002-0290-7656
Ingrid I. E. Staal https://orcid.org/0000-0001-8279-8340
Marlou L. A. de Kroon https://orcid.org/0000-0003-1730-4994
Theo van Achterberg https://orcid.org/0000-0003-0111-6622

REFERENCES


Roseboom, T. (2018). De eerste 100 dagen (The first 1000 days). De Tijdstroom [Book in Dutch].


The *Journal of Advanced Nursing (JAN)* is an international, peer-reviewed, scientific journal. JAN contributes to the advancement of evidence-based nursing, midwifery and health care by disseminating high quality research and scholarship of contemporary relevance and with potential to advance knowledge for practice, education, management or policy. JAN publishes research reviews, original research reports and methodological and theoretical papers.

For further information, please visit JAN on the Wiley Online Library website: www.wileyonlinelibrary.com/journal/jan

**Reasons to publish your work in JAN:**

- High-impact forum: the world’s most cited nursing journal, with an Impact Factor of 2.561 – ranked 6/123 in the 2019 ISI Journal Citation Reports © (Nursing; Social Science).
- Most read nursing journal in the world: over 3 million articles downloaded online per year and accessible in over 10,000 libraries worldwide (including over 6,000 in developing countries with free or low cost access).
- Fast and easy online submission: online submission at http://mc.manuscriptcentral.com/jan.
- Positive publishing experience: rapid double-blind peer review with constructive feedback.
- Rapid online publication in five weeks: average time from final manuscript arriving in production to online publication.
- Online Open: the option to pay to make your article freely and openly accessible to non-subscribers upon publication on Wiley Online Library, as well as the option to deposit the article in your own or your funding agency’s preferred archive (e.g. PubMed).