RESEARCH PAPER

Validation of Hindi Translation of Survey of Well-Being of Young Children Tool in Indian Children

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Objective: To validate the Hindi translation of Survey of well-being of young children (SWYC), a screening questionnaire to detect developmental delay and emotional-behavior problems by primary caregivers in Indian children. **Methods:** This cross-sectional observational study was done at the child development clinic of our private-sector tertiary care hospital. 180 children of either sex, 60 each in age group of 9, 18 and 24 months were enrolled in the study (30 high-risk and 30 low-risk in each group). Hindi translated version of SWYC age-specific questionnaire was administered to the parents, followed by a standardized development assessment by using the Bayley Scale of Infant and Toddler Development (BSID III). **Results:** SWYC Milestone score and Emotional/behavior scores showed a statistically significant correlation with BSID III (P<0.001). Milestone score's overall sensitivity in detecting developmental delay was 94.4% and specificity was 93.4%. The sensitivity was best for the 24-month (100%) and specificity was best for 18-month questionnaire (96.7%). Behavioral score's overall sensitivity was 68.4% and specificity 92.3%. The best sensitivity was for 18-month questionnaire (72%), and specificity for 24-month questionnaire (100%). SWYC had better sensitivity for detecting developmental delay in high-risk group (95.4%), and higher specificity in low risk group (95.5%). **Conclusion:** SWYC has strong test characteristics for detecting milestone delay and emotional/behavior problems in Indian children.

Keywords: *Developmental delay, Emotional-behavior problems, Screening tool.*

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Most of the available screening tools in India do not assess emotional/behavioral problems in children [1]. Pediatricians frequently fail to identify children with developmental-behavioral problems if they use only clinical impressions rather than formal screening [2]. It is mainly in the first few years of life that the development of sensory-motor, social-emotional and cognitive skills occurs, which is essential for success in the next stages of life [1,2], and interventions at this stage help in improving outcomes [3]. The American Academy of Pediatrics (AAP) committee on childhood disability [3] recommends screening all children using standardized developmental screening tools at 9, 18, and 30 (or 24) months of age.

The Survey of well-being of young children (SWYC) is a comprehensive, first-level developmental-behavioral screening tool for children under 5.5 year of age [4]. The psychometric properties of the original SWYC has been shown to be adequate (sensitivity 0.7-0.89, specificity 0.54-0.9) [2-6]. It is designed to be completed by parents or other caregivers in the context of pediatric primary care visits, but can also be used in other settings [6]. The entire instrument takes most parents 10 minutes to complete. There are 12 SWYC forms as per age, and these are available in various languages. However, no study is available on its use in Indian children. We planned this study to evaluate the ability of SWYC to detect developmental delay and emotional/behavior problems in Indian children.

METHODS

The study was conducted at the Child development clinic, of our hospital, from October, 2020 to September, 2021 after institutional ethics committee clearance. Consecutive children in three age groups; 9 month (9 month, 0 day to 11 month, 31 day),18 month (18 month, 0 days to 22 month, 31 day), and 24 month (23 month, 0 day to 28 month, 31 day), attending the pediatric outpatient department of the hospital were enrolled in the study, after informed parental consent. Risk stratification was done and the included children were stratified into high-risk group (children with any of the following risk factors: history of hospitalization in the first four days of life, birthweight <2 kg, gestation age <37 weeks, history of central nervous systems infections, known dysmorphic syndrome or chromosomal anomalies,

evolving cerebral palsy or developmental delay, and or history of two or more episodes of afebrile seizures) and low-risk groups (children with none of the above mentioned risk factors). Children with non-availability of birth records, and without accompanying primary caregiver at the time of evaluation were excluded from the study.

The SWYC is a structured interview with 40 questions that assesses multiple domains of a child's well-being: cognitive, language, and motor development; behavioral and emotional adjustment; autism risk; and family stress [8,9]. To assess these domains, each SWYC form includes four components: *i*) SWYC Milestones, which is a questionnaire with 10 questions for each age group to evaluate developmental milestones (cognitive, motor, social, and language skills); *ii*) Baby Pediatric Symptom Checklist (BPSC) for age below 18 month or Preschool Pediatric Symptom Checklist (PPSC) for children aged 18 to 65 months [10,11], *iii*) Family Questions domain contains 9 items, child behavior and learning/develop-ment; and, *iv*) Parent's Observation of Social Interaction (POSI) to assess risk for autism spectrum disorder (ASD) for children between 16 and 36 month of age [11]. We evaluated only the SWYC Milestone scores and Emotional /Behavior domain. Although, designed as a compre-hensive screening tool, it is acceptable to use individual parts of SWYC separately to meet particular needs [6].

For the present study, only 9-month, 18-month, and 24-month questionnaires were used. The SWYC questionnaire was translated into Hindi language and back translated to English language and this procedure was repeated until the back translation matched the English version. The translation was done independently by language experts.

Sample size calculation was done based on a previous study [7] to assess the SWYC– the minimum required sample size at 5% level of significance was taken. Total 180 children of either sex, 60 in each of the three specified age strata (9 months, 18 months, and 24 months) were enrolled in the study. In each age group, 30 'low-risk' and 30 'high-risk' children were enrolled. A detailed history and physical examination were done for all the children at the time of enrolment, followed by the administration of the Hindi version of the SWYC screening tool by a pediatric resident, who was trained by a developmental pediatrician, to any of the available parents, mostly mothers.

On the same day, developmental assessment of the child was also done by a single clinical psychologist using the Bayley Scale of Infant and Toddler Development (BSID III). Clinical psychologist was blinded to the scores on SWYC. Developmental quotient (DQ) <85 was taken as the cut-off score on BSID III [12] for labelling developmental delay. We compared the mean DQ (sum of cognitive, language and motor DQ) <85 with SWYC Milestone score, and DQ in social-emotional domain <85 with SWYC emotional/behavioral score.

A child failed on SWYC screening, when the scores were not as per the screening threshold. Children who failed on developmental screening were subjected to early intervention including parent counseling and training.

Statistical analysis: The Statistical Package for Social Sciences (SPSS) was used for all analyses. The psychometric properties of SWYC were calculated using BSID III as gold standard. Wilcoxon-Mann-Whitney U test was used to make group comparisons. The Chi-square test was used to observe the association between SWYC and BSID III scores. Spearman correlation coefficient was used for correlation between the SWYC and BSID III scores.

Table I Demographic Characteristics of the Study Sample

Characteristics	*No. (%)*
Male gender	111 (61.7)
Mother's age (y)	
<20	2 (1.1)
20-29	120 (66.7)
30-35	50 (27.8)
>35	8 (4.4)
Antenatal problems[a]	
Anemia	10 (5.6)
Pregnancy-induced hypertension	15 (8.3)
Antepartum hemorrhage	6 (3.3)
Gestational diabetes mellitus	5 (2.8)
Cesarean delivery	118 (65.6)
Mother's education[b]	
Primary	6 (3.3)
Secondary	12 (6.7)
Graduate	66 (36.7)
Postgraduate	92 (51.1)
Father's education[b]	
Primary	5 (2.8)
Secondary	8 (4.4)
Graduate	79 (43.9)
Postgraduate	86 (47.8)
Risk factors in the high risk group[c]	
Prematurity	13 (14.4)
Low birth weight	9 (10)
Hospitalization in first 4 d	33 (36.7)
Evolving cerebral palsy/developmental delay	23 (25.6)
Known dysmorphic syndrome/chromosomal abnormalities	11 (12.2)
Epilepsy	5 (5.6)

[a]2 mothers had fever with rash in the antenatal period; [b]4 mothers and 2 fathers were illiterate; [c]history of a neuro-infection was present in 2 children.

Table II Screening Test Characteristics of Survey of Well-Being of Young Children (SWYC) Milestone Score and SWYC Emotional/Behavior Score for Predicting Bayley Scale of Infant and Toddler Development Social Emotional score <85

Age group	*SWYC components*	*Sensitivity*	*Specificity*	*PPV*	*NPV*	*Diagnostic accuracy*
9 month	Milestone score	89.7%	93.5%	92.9%	90.6%	91.7%
	Emotional/behavior score	61.9%	89.7%	76.5%	81.4%	80%
18 month	Milestone score	93.3%	96.7%	96.6%	93.5%	95%
	Emotional/behavior score	72%	88.6%	81.8%	81.6%	81.7%
24 month	Milestone score	100%	90%	90.9%	100%	95%
	Emotional/behavior score	70.0%	100%	100%	76.9%	85%
Overall	Milestone score	94.4%	93.4%	93.3%	94.4%	93.9%
	Emotional/behavior score	68.4%	92.3%	86.7%	80%	82.2%

PPV: positive predictive value, NPV: negative predictive value.

Statistical tests with a 5% level of significance were considered significant.

RESULTS

Out of the total of 180 children enrolled in the study, 61.7% were boys. Most of the mothers were aged 20-29 year at the time of conception. Antenatal problems were detected in 21.1% of the mothers. **Table I** shows the baseline characteristics of the enrolled children, and the presence of risk factors.

The overall sensitivity of SWYC in detecting developmental delay was 94.4% and specificity was 93.4%. The sensitivity was found to be good for detecting developmental delay in all the three age groups (9, 18, and 24 months). The sensitivity was much higher in the high-risk group (95.4%) as compared to the low-risk group (50%).

The overall sensitivity of SWYC in detecting behavior problems was 68.4% and specificity was 92.3%. The sensitivity was best for the 18 months questionnaire (72%) and the specificity was best for the 24 month questionnaire (100%) (**Table II)**. The sensitivity for emotional / behavioral questionnaire was found to be good for 18 and 24 month and was low for 9 month questionnaire. This may be related to the fact that parental assessment of detecting behavior problems in infancy is less objective. The sensitivity for detecting behavior problems in high-risk group was 68% and 100% in low-risk group.

DISCUSSION

In this study to evaluate the SWYC as a screening tool for developmental and behavior problems in the Indian children, we found that the tool had good psychometric properties for screening of developmental delay. The sensitivity of SWYC for detecting developmental delay was good for children of all three age groups tested, the specificity was best for the 24 month questionnaire. The overall sensitivity and specificity of SWYC in detecting behavior problems was also statistically significant. While sensitivity for emotional/behavior questionnaire of SWYC was low for 9 month age group. This may be related to the fact that parental assessment of emotional/ behavior/ domain in infancy is less objective. The test characteristics of the SWYC were studied both in low-risk and high-risk children also. The limitation of our study is the small sample size, as well as the hospital-based setting.

The validity and reliability of the original SWYC version is similar to those of other screening instruments quoted in the literature. Psychometric properties of original SWYC were found to be adequate. Other studies have used SWYC to screen for developmental delay only using SWYC milestones without taking into account the emotional/behavioral aspects. SWYC is a useful screening tool to detect emotional/behavior problems in Indian children, especially at 18 and 24 months of age. Though further large scale studies are needed to evaluate SWYC in the Indian population at all age groups.

Ethics clearance: IEC, Sir Ganga Ram Hospital; No. EC/01/21/1824 dated Feb 26, 2021.
Contributors: PS: involved in study designing, recruitment of the patients, literature review and final revision of manuscript; IN,RT: assessment of the patients and literature review. All authors approved the final version of manuscript, and are accountable for all aspects related to the study.
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WHAT THIS STUDY ADDS?

- The Survey of well-being of young children (SWYC) showed good sensitivity and specificity to detect developmental delay as well as emotional/behavioral problems in children.
- The sensitivity of SWYC for detecting developmental delay was higher in the high-risk group whereas specificity was higher in the low-risk group.

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