

Usage and awareness of nutritional screening tools by nurses caring for pediatric patients in Yozgat province

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ABSTRACT

Aims: Malnutrition is a significant health issue in children and is closely related to prolonged hospital stays, increased complications, and mortality risk in hospitalized children. Effective use of nutritional screening tools is crucial for early detection of malnutrition. In this context, the active use of nutritional screening tools, the skill to use these tools, and the level of awareness about these tools among nurses who closely care for pediatric patients are vital factors that can potentially improve pediatric patients' health. Our study examines the usage and awareness of nutritional screening tools among nurses caring for pediatric patients in Yozgat province, a region with unique healthcare challenges and opportunities.

Methods: The study was planned as a prospective, descriptive, and cross-sectional design. Ninety-four nurses caring for pediatric patients in Yozgat province and its districts were administered an online questionnaire of 22 questions, which was designed to assess their knowledge, skills, and attitudes towards nutritional screening tools. The questionnaire was distributed through a secure online platform and included both closed-ended and open-ended questions. Data were evaluated using descriptive statistics with SPSS version 27.0.

Results: Of the participants, 78.7% were female and 21.3% were male. 60.6% of the participants were in the age range of 25-34 years, 62.8% had a bachelor's degree, 66% worked at state university hospitals, 30.9% had 6-10 years of professional experience, 74.5% were service nurses, and 39.4% had been involved with pediatric patients for 0-1 years. The most frequently cared age group was 3-6 years (19.9%) and 1-3 years (18.1%). 27.7% of the participants assessed nutrition risk status using visual assessment, 25.5% through anthropometric measurements, and 34% reported referring the physician and dietitian for intervention in risk detection. 47.9% indicated the presence of a screening scale in their institution, 57.1% used the form, 25.5% did not know the name of the screening scale, and 6.4% used the StrongKids scale.

Conclusion: Our study determined that nurses caring for pediatric patients often consider the screening scale as a secondary option for identifying the nutrition risk status, predominantly performing visual and anthropometric evaluations, and did not demonstrate sufficient proficiency or importance regarding screening scales. Although the determination of risk status varies according to the scale used, the significance of screening scales in detecting malnutrition is substantial. Therefore, our study recommends that necessary training be provided to pediatric nurses to use these tools more effectively and that current practices be reviewed. This will not only enable better assessment of the nutritional status of pediatric patients but also instill hope for the implementation of steps to prevent malnutrition.

Keywords: Malnutrition, nutritional screening tools, pediatric patient, pediatric nursing

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INTRODUCTION

The development of children's nutritional skills can influence their optimal nutritional status, and deficiencies in these skills may lead to chronic diseases and malnutrition in the future.¹ Therefore, efforts are being made to assess individuals' nutritional status.^{2,3} Nutritional monitoring is especially crucial for diseases such as cancer.

Malnutrition is a significant health issue and is closely related to prolonged hospital stays, growth retardation in children,

increased complications, and mortality risk.⁴⁻⁷ Adverse outcomes such as muscle tissue loss, delayed wound healing, and prolonged hospitalizations are potential complications in prolonged stays and malnutrition.^{3,8}

For these reasons, the effective use of nutritional screening tools is vital for the early detection of malnutrition. Improving individuals' health status can be achieved in this way.^{3,4} During the treatment of diseases such as cancer in children, the use



and awareness of screening tools by dietitians and nurses are essential.² Various nutritional screening tools such as STRONGkids, pediatric nutrition screening tool (PNST), pediatric Yorkhill malnutrition score (PYMS), and subjective global nutritional assessment (SGNA) are used for this purpose.^{3,8-10} Some studies have pointed out that the complexity of existing pediatric screening tools poses a barrier to their widespread clinical application.⁹ Therefore, it is suggested that the validity, effectiveness, and ease of use of pediatric nutritional screening tools should be evaluated to improve the nutritional care processes in hospital settings.

Based on this information, nurses caring for pediatric patients' active use of nutritional screening tools, their skills in using these tools, and their awareness about them are vital factors that can potentially improve pediatric patients' health. Studies are being conducted on the content, general characteristics, and validity and reliability of scales used to screen and assess the nutritional status of pediatric patients in Turkey.⁵ However, it should also be noted that there is a lack of data in Turkey. The aim of our study is to examine the usage and awareness of nutritional screening tools among nurses caring for pediatric patients in Yozgat province.

METHODS

The study was planned as a prospective, descriptive, and cross-sectional design after obtaining permission from the Ethics Committee of Yozgat Bozok University Social and Human Sciences (Date: 28.06.2024, Decision No: 15/22). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki. A 22-question online questionnaire was administered to 94 nurses caring for pediatric patients in Yozgat province and its districts. Data were evaluated using descriptive statistics with SPSS version 27.0. The results were discussed alongside the literature.

RESULTS

Of the participants, 78.7% were female. The group predominantly comprised nurses aged 25-34 (60.6%). 62.8% had a bachelor's degree. 66% worked in state university hospitals. 30.9% of the nurses had been practicing nursing for 6-10 years and constituted the majority. The proportion of service nurses was 78.7%. The percentage distribution of the ages of the patients the employees cared for showed similarities. These distributions are presented in [Table 1](#).

24.8% of the participants reported having heard of the pediatric nutrition risk score (PNRS), 8.5% reported having heard of the SGNA, 17.0% reported having heard of the screening tool for malnutrition assessment in children (STAMP), 4.6% reported having heard of the PYMS, 15.0% reported having heard of the Screening Tool for Nutrition Status and Growth Risk (STRONGkids), 9.8% reported having heard of the PNST, while 20.3% reported having heard of none of these tools. These data are presented in [Table 2](#).

51.1% used anthropometric measurements (such as height, weight, and head circumference) for every hospitalized pediatric patient, 11.7% sometimes used them, and 37.2% did not use them at all; 19.9% used a screening scale, 25.5% used anthropometric measurements, 12.8% used biochemical findings, and 27.7% used visual assessment to determine

Table 1. Demographic information of individuals

Gender	Number (n)	Percent (%)
Female	74	78.7
Male	20	21.3
Age		
18-24	9	9.6
25-34	57	60.6
35-44	22	23.4
45 years and older	6	6.4
Education		
High school	8	8.5
Associate	13	13.8
Bachelor	59	62.8
Master's	11	11.7
Doctorate	3	3.2
Institution worked		
State university hospital	62	66.0
State hospital	8	8.5
City hospital	20	21.3
Private hospital/clinic	1	1.1
Family health center	3	3.2
Years in profession		
0-1 year	7	7.4
2-5 years	20	21.3
6-10 years	29	30.9
11-15 years	23	24.5
16 years and older	15	16.0
Job in the unit		
Service nurse	74	78.7
Clinic nurse	8	8.5
Neonatal nurse	10	10.6
Family health center nurse	2	2.1
Years caring for pediatric patients		
0-1 year	37	39.4
2-5 years	26	27.7
6-10 years	17	18.1
11-15 years	8	8.5
16 years and older	6	6.4
Frequently cared age groups*		
0-1 age range	37	17.1
1-3 age range	39	18.1
3-6 age range	43	19.9
6-9 age range	32	14.8
9-12 age range	27	12.5
12-18 age range	38	17.6

nutrition risk status, while 14.2% did not use any of these methods. These results are presented in [Table 3](#).

47.9% of the participants indicated that a screening scale was used to evaluate the nutrition risk status of children in their institution, 28.7% stated it was not used, and 23.4% were unsure. 1.1% indicated they used anthropometric measurements as a form, 1.1% used percentiles, 3.2% used the child health monitoring form, 1.1% used the nutrition status evaluation form, 2.1% used the child nutrition form, 1.1% used the NRS-2002 form, 4.3% used the nutrition form, and 6.4% used the STRONGkids form, while 27.6% did not know which form was used. Results are detailed in [Table 3](#).

40.0% of the participants stated they used this form regularly; 1.1% did not use it due to increased workload; 21.1% did not know how to use it, 30.0% indicated that there was no form available; 4.4% said the physician did not request it, and 3.3% stated they did not see the need for it. Results are shown in [Table 3](#).

**Table 2.** Knowledge of nutritional screening tools among individuals**Information on which screening scales nurses have heard of***

	Number (n)	Percent (%)
Pediatric nutrition risk score (PNRS)	38	24.8
Subjective global nutritional assessment (SGNA)	13	8.5
Screening tool for malnutrition assessment in children (STAMP)	26	17.0
Pediatric Yorkhill malnutrition score (PYMS)	7	4.6
Screening tool for nutrition status and growth risk (STRONGkids)	23	15.0
Pediatric nutrition screening tool (PNST)	15	9.8
None	31	20.3

Information on which screening scales nurses have used

	Number (n)	Percent (%)
Pediatric nutrition risk score (PNRS)	31	23.7
Subjective global nutritional assessment (SGNA)	13	9.9
Screening tool for malnutrition assessment in children (STAMP)	13	9.9
Pediatric Yorkhill malnutrition score (PYMS)	6	4.6
Screening tool for nutrition status and growth risk (STRONGkids)	19	14.5
Pediatric nutrition screening tool (PNST)	8	6.1
None	41	31.3

*More than one choices were marked

Table 3. Usage information of nutritional screening tools by individuals

Use of anthropometric measurement for every hospitalized child	Number (n)	Percentage (%)
Yes	48	51.1
No	35	37.2
Sometimes	11	11.7
Methods for assessing nutrition risk status*		
Screening scale	28	19.9
Anthropometric measurement	36	25.5
Biochemical findings	18	12.8
Visual assessment	39	27.7
None	20	14.2
Intervention methods for nutrition risk identification *		
Referred to physician	82	65.1
Referred to dietitian	37	29.4
Unsure	7	5.6
Use of screening scale for evaluating nutrition risk status of children in the institution		
Yes	45	47.9
No	27	28.7
Unsure	22	23.4
Form used for evaluation**		
Anthropometric measurement	1	1.1
Percentile	1	1.1
Child health monitoring form	3	3.2
Nutrition status evaluation form	1	1.1
Child nutrition form	2	2.1
NRS-2002 form	1	1.1
Nutrition form	4	4.3
STRONGkids	6	6.4
Unsure	26	27.6
Information on the use of form for evaluating nutrition risk status of children by nurses*		
I use it	36	40.0
I don't use it;		
Increases my workload	1	1.1
I don't know how	19	21.1
No form	27	30.0
Physician does not request	4	4.4
I don't feel the need	3	3.3

*More than one choices were marked.

**Evaluated among replies "Yes"



When identifying nutrition risks, 65.1% of the participants referred to a physician, 29.4% referred to a dietitian for intervention, and 5.6% were unsure how to intervene.

DISCUSSION

In our study, participants, composed of nurses, were asked about nutrition evaluation, various screening tests, their knowledge about usage, and what assessments were made in nutrition evaluation. The responses given were evaluated. Among the participants, 20 nurses (14.2%) stated that no nutritional assessment was conducted with any application, and 52.1% of the nurses reported that there was no institutional information provided on this issue, or if there was, they were not informed about it; 27.6% were unaware of any screening tools. The most cited reason for not using screening tools was the absence of a form. Nevertheless, 95% of the nurses said there must be an intervention for patients with a nutritional problem.

Various screening tools used to identify functional nutritional disorders in children are effective, and the significance of screening scales in detecting malnutrition is considerable.^{1,4} Some of these tools have demonstrated the ability to quickly and accurately identify nutritional disorders in children. However, it is also recognized that some tools contain numerous questions, making their use complex. Overall, research findings emphasize the importance of selecting an appropriate screening tool for detecting nutritional disorders in children for healthcare professionals.¹ However, it reveals that these tools are generally underutilized and that more studies are needed.⁴ Our study also determined that nurses caring for pediatric patients considered the screening scale as a secondary option for identifying the nutrition risk status, predominantly performing visual and anthropometric evaluations, and did not demonstrate sufficient proficiency or importance regarding screening scales. Among the participants, 31 nurses (20.3%) reported they were unaware of the screening tools, and 41 nurses (31.3%) stated they did not use screening tools, which is considered a significant figure. Although it was determined that visual and anthropometric evaluations were being conducted, it was found that 35 nurses (37.2%) did not perform anthropometric measurements. Similar findings were noted in a study conducted in Canada, where more than 50% of nurses underestimated the prevalence of malnutrition in hospitalized patients, yet 92.5% were willing to include a nutritional screening process in inpatient admission procedures.⁴ In the same study in Canada, 17% of nurses indicated that helplessness in eating was a significant cause of malnutrition, 39% reported limited access to nutrition education, and 92% expressed interest in such training.

In a study conducted in Korea, 78.7% of nurses believed that nutritional management was necessary, a value lower than what we found in our study. In the same study, 34.9% of nurses claimed to have knowledge of at least one criterion for nutritional assessment, but the percentage of those aware of the normal range for body-mass index (BMI) was only 0.9%, indicating a significantly low level of awareness. Our study similarly found a meager percentage of knowledge regarding screening tools and low usage rates of assessment criteria outside of the screening tools.

Similar results were found in a study conducted in New Zealand. It was observed that the use of nutritional screening

tools for pediatric oncology patients was limited, and dietitians had insufficient awareness and resources.² Standard screening and assessment methods for detecting malnutrition were recommended. It was understood that the usage issues faced in various world regions share common causes.

Another study found that pediatric malnutrition screening tools are beneficial in clinical use, but some challenges were faced in practice.¹¹ Newly developed tools effectively monitor malnutrition risk, especially in children who stay in the hospital for a long time. However, it was noted that the most significant barriers faced by healthcare workers in using these tools were time, cost, and resource shortages. The importance of simplifying and integrating these tools into healthcare processes was emphasized.¹¹

Another issue regarding usage is that the reliability and validity of nutritional screening tools used to identify pediatric malnutrition may vary.³ However, it has also been emphasized that these tools are essential for the early detection of malnutrition.³ A study evaluating the PYMS screening tool and STRONGkids found that PYMS had higher sensitivity and specificity in detecting malnutrition risk than STRONGkids. The sensitivity of PYMS was 95.7%, and its specificity was 66.7%. In contrast, the sensitivity of STRONGkids was 52.2%, and its specificity was 41.7%. The results indicate that PYMS is a more reliable and effective tool for screening malnutrition in children. It is noted that PYMS is a practical screening tool and can be preferred in clinical settings, mainly due to its ability to be applied in a short time.¹⁰ In another study, STAMP, STRONGkids, and the PYMS were found to have moderate validity and reliability in hospital settings.⁷ However, it was determined that tools used in community settings did not meet these criteria. The research highlights that the validity and reliability of nutritional screening tools show differences based on the users and that the tools should be standardized. As a result, it is stated that the tools used for detecting pediatric malnutrition need more validation studies.^{3,7} Most existing screening tools have not been tested in specific age groups or integrated into electronic health records.⁴ Tools like STRONGkids and PNST are essential for the early detection of malnutrition, but there is a need for more valid studies in younger age groups and broader populations. It is emphasized that increasing training and widespread use of the tools in clinical practice is necessary.⁴ In this context, it can be concluded that an ideal nutritional screening tool should correctly identify high-risk patients while excluding those with low risk.³

In another study, it was determined that both STRONGkids and PNST screening tools could identify the risk of malnutrition in children, but the initially proposed cutoff points were not suitable for the study population.¹² In the same study, adjustments based on ROC curve analysis showed that both tools had better concordance with nutritional status assessment when adjusted cutoff points were applied.¹² In particular, PNST was found to have a higher sensitivity with adjusted cutoff points and was more suitable for clinical use. Both tools could assist in detecting malnutrition, but PNST was noted as the most appropriate tool with the revised cutoff points.¹² In another study, PNST was found to be a simple screening tool that quickly and accurately detects the risk of malnutrition in pediatric patients.⁹ The study demonstrated that PNST showed 77.8% sensitivity and 82.1% specificity compared to the



Pediatric SGNA. These results indicate that PNST is a reliable and applicable option for effectively detecting malnutrition risk in pediatric hospital admissions as an alternative to the more complex existing tools. However, it was also noted that PNST has limitations in detecting particularly chronic malnutrition or overweight children.⁹

Some studies have reported positive results and a continuous increase in the use of nutritional screening tools. In a study conducted in Belgium, the STRONGkids screening tool effectively identified malnutrition risk in hospitalized children.¹³ The study determined that STRONGkids could detect acute malnutrition with 71.9% sensitivity and a 94.8% negative predictive value (NPV). The tool was also associated with the length of hospital stay, indicating that children who stayed there for 4 days or longer were at risk of malnutrition. The tool also showed a high predictive value (98.9%) for initiating nutritional interventions. As a result, STRONGkids was indicated to be both a practical and a reliable tool for determining the risk of malnutrition in children.¹³ In a study conducted in Brazil, the STRONGkids tool demonstrated strong performance in predicting prolonged hospital stays in pediatric patients.¹³ It was found that children with 3 points behaved similarly to those at high risk with 4 or 5 points. Therefore, it was concluded that patients scoring 3 points with STRONGkids in hospitals in Brazil should be considered at high risk, similar to those scoring 4 or 5 points. This is an essential step in preventing extended hospital stays and adverse clinical outcomes.¹⁴

A study conducted in Turkey noted that scales used for screening pediatric nutritional status may not be suitable for every patient and that ethnic, developmental, and disease-specific differences could affect the effectiveness of screening tools.⁵ In this study, it was particularly stated that scales such as STRONGkids and the PYMS were widely used to determine the risk of malnutrition in children, but there were limited validity and reliability studies on these scales in Turkey.⁵ It was concluded that the simplicity and practicality of existing scales supported their widespread use in practice. The importance of education for healthcare professionals to increase the use of screening and assessment tools was emphasized.⁵ Another study conducted in Turkey used the STRONGkids screening tool, which was found to be reliable for assessing nutrition risk in neurology patients. In this study, patients at risk of malnutrition were identified through screening, and opportunities for early intervention were provided. Furthermore, it was concluded that STRONGkids, a simple and practical screening tool, could be widely used in clinical settings. However, it was emphasized that more detailed assessments are needed, especially for identifying advanced malnutrition cases.⁶

In another study, 302 nurses participated in an evaluation in Turkey. The level of knowledge regarding nutrition was around 50%, and it was recommended that nursing education institutions review their curricula in terms of clinical nutrition education and develop a regular nutritional education program. This recommendation is consistent with our conclusions.¹⁵

In cases with a high rate of underutilization or unawareness of screening tools, awareness-raising efforts should be made to mitigate this situation. For example, a study conducted in Norway aimed to evaluate the changes in clinical nutritional care after ten years of implementing national nutritional

guidelines. A study conducted in 2004 revealed that there was a lack of information about nutritional care among doctors and nurses, and inconsistencies were found in practices.¹⁶ A follow-up study with a similar questionnaire in 2014 showed significant improvements in nutritional practices. In a similar study in Norway, while 67% of participants identified the lack of information as a fundamental barrier in 2004, this rate decreased to 57% in 2014 ($p < 0.001$).¹⁷ In this study, findings from 2004 indicated that similar to our study, only 46% of nurses had difficulties identifying undernourished patients, assessing their energy needs, and developing a nutritional plan. However, in 2014, it was observed that 57% of the participants were knowledgeable about the topic, indicating an increase in their level of knowledge.¹⁷

In a study conducted in England evaluating the use of nutritional screening tools, various recommendations were made to increase the use of these tools.¹⁸ It was emphasized that regular routines are essential to maintain nutritional screening effectively. Most participants indicated that they developed various routines, such as conducting weekend screenings, to ensure that the screening process was not interrupted. The importance of nutritional assessment and communication with patients was highlighted regarding good practices in nutritional care. Participants noted that understanding patients' nutritional habits and developing personalized nutrition plans were critical for providing adequate care. It was concluded that nurses should have more autonomy in nutritional care. Nutritional screening is seen as a process that requires clinical judgment, and it is suggested that increasing nurses' decision-making authority will enhance the quality of nutritional care.¹⁸

CONCLUSION

It is recommended that necessary training be provided to pediatric nurses to use these tools more effectively and that current practices be reviewed. This will enable better assessment of the nutritional status of pediatric patients and the implementation of steps to prevent malnutrition. It is stated that there is a need to increase awareness of nutritional assessment and human resources to ensure the use of the mentioned tools, and steps should be taken to promote the more widespread use of screening tools as indicated in the literature.

ETHICAL DECLARATIONS

Ethics Committee Approval

The study was conducted with the permission of Yozgat Bozok University Social and Human Sciences Ethics Committee (Date: 28.06.2024, Decision No: 15/22).

Informed Consent

All patients signed and free and informed consent form.

Referee Evaluation Process

Externally peer-reviewed.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

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Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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