Development of Knowledge-Attitude-Practice Questionnaire on Oral Nutrition Supplement among Nurses in Oncology Department and its Reliability and Validity Test

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Abstract

To develop a questionnaire on oncology nurses’ knowledge-attitude-practice towards oral nutrition supplementation, and to test its reliability and validity.

Methods: Based on literature review and Delphi expert correspondence, the initial questionnaire was constructed on the basis of knowledge-attitude-practice mode. A total of 265 oncology nurses from 5 tertiary care hospitals in Jiangsu Province were selected by convenience sampling method for pre-survey to test the reliability and validity of the questionnaire and form the final version.

Results: The questionnaire included three dimensions: knowledge, attitude and practice, with a total of 43 items; exploratory factor analysis extracted a total of five common factors, with a cumulative variance contribution rate of 81.087

Index terms — nurses; oral nutritional supplements; knowledge-attitude-practice; reliability; validity.

1 Introduction

Cancer patients often suffer different degrees of malnutrition, which affect the function of body tissues and organs, resulting in a decrease in the patient’s tolerance to treatment and the curative effect of tumor treatment, thereby affecting the quality of life and prognosis of patients [1]. Therefore, for cancer patients, nutritional therapy is an essential part of comprehensive cancer therapy. Oral nutritional supplements (ONS) are formulas (foods) for special medical purposes that are ingested orally to supplement insufficient daily diet, and meet the body’s nutritional needs by providing nutrients such as carbohydrates, proteins, and fats [2], is the preferred way of nutritional therapy for patients with normal gastrointestinal function and able to eat orally [3]. ONS can improve the nutritional status of cancer patients, prevent malnutrition and its complications, and enhance anti-tumor efficacy [4]. As the nurses who are most closely contacted during the inpatient treatment of cancer patients, their cognitive and behavioral levels of ONS will affect the patient’s compliance with ONS and the effect of nutritional therapy [5]. An evaluation tool for ONS knowledge, belief, and behavior by nurses. Therefore, by compiling a questionnaire on ONS knowledge, belief, and behavior of oncology nurses and testing its reliability and validity, this study provides an evaluation tool for evaluating the status quo of ONS knowledge, belief, and behavior among oncology nurses, and provides targeted training programs and scientific management strategies.

2 Research Methodology

3 Compile the ONS Knowledge, Credit and Action Questionnaire a) Setting up a research group

The research group consisted of 6 members who were familiar with the research contents, including 2 chief physicians of the oncology department, 2 deputy chief nurses and 2 nursing master students. The members of the group are responsible for the formulation of the initial items of the questionnaire, carrying out inquiries from Delphi experts, preinvestigation of the initial questionnaire, and data collection, arrangement and analysis.
5  b) Compile the initial item pool of the questionnaire

This study is based on the knowledge, belief, and action model [6]. The research team discussed the major and difficult issues related to ONS in cancer patients, followed the best evidence for the implementation and management of ONS in patients with malignant tumors summarized by Zhu Yuxia et al. The initial item pool for the questionnaire. The formed questionnaire item pool includes a total of 51 items, including 12 knowledge dimensions, 16 belief dimensions, and 23 behavior dimensions, mainly covering ONS pre-use assessment, scope of application, formulation selection, risk assessment, efficacy evaluation, and health education.

6  c) Delphi expert correspondence i. Develop an expert letter questionnaire

The Expert Letter Questionnaire consists of 4 parts. The first part is the preface, including the background, purpose, significance and filling requirements of the questionnaire; the second part is the basic information of the expert, mainly including the expert’s age, education, work field, working years, professional title and position, etc.; the third part For the "Oncology Nurses ONS Knowledge, Attitude and Action Questionnaire Item Evaluation Form", experts are required to use the Likert 5-point scoring method to evaluate the importance of each item, "1-5 points" respectively indicate "not important", "not very important", and "generally important" "More important" and "Very important", and set up "Item Modification Opinion Column" and "Add Item Column" for experts to fill in their opinions and suggestions; the fourth part is the self-assessment form for the degree of authority of experts, including the expert's familiarity with the content and Judgment is based on two aspects.

ii. Selection of correspondence experts Expert selection criteria: high academic level in the field of ONS; engaged in oncology related work for > 10 years; bachelor degree or above; intermediate or above professional title; actively participate in and support this research. A total of 15 experts were invited to participate in the letter inquiries, aged 36-51 (44.07±4.59) years old; education: 9 undergraduates (60%), 6 masters (40%); working years 10-31 (19.93±6.44) years; Professional Title: 1 Intermediate Professional Title (6.67%), 14 Senior Professional Title (93.33%); Position: 5 Clinical Nursing (33.33%); 9 Nursing Management (60%); 1 Nursing Education (6.67%).

7  d) Item revisions

Questionnaires are distributed and returned by means of electronic communication. A total of 2 rounds of expert correspondence were conducted in this study, and the effective recovery rates of the questionnaires in both rounds were 100%, indicating that the experts were highly motivated and attached great importance to this research; the authoritative coefficients of the experts in the 2 rounds of correspondence were 0.893 and 0.921, both >0.7 , indicating that the degree of authority of experts is high, and the results of letter inquiry are reliable; the Kendall coordination coefficients of the two rounds of expert letter inquiry are 0.135 and 0.149 respectively (P<0.001). After the two rounds of correspondence, the average value of each item was 4.06 to 5.00, and the coefficient of variation was 0 to 0.18, indicating that the experts had basically reached an agreement and no further correspondence was required.

Taking the item importance evaluation average score < 3.5 and the coefficient of variation > 0.25 as the criteria for item deletion [9], the research team revised the items based on expert opinions. After the first round of inquiries, the research team made the following changes: delete "A4: I think oncology nurses should have the relevant knowledge and skills of ONS"; delete "P12: I will provide patients with different types and flavors of ONS preparations", to guide patients to choose appropriate ONS preparations; merge "A6: I think oncology nurses play an important role in improving the efficacy of ONS in patients" and "A7: I think oncology nurses should pay attention to the treatment and care of ONS in cancer patients" as "A17: I think oncology nurses should pay attention to the treatment and care of ONS in cancer patients and play an important role"; will "A11: I think oncology nurses should accurately identify the adverse reactions after ONS, such as gastrointestinal intolerance symptoms, elevated blood sugar, etc."A12: I think oncology nurses should be proficient in the preventive measures and correct treatment methods for adverse reactions after ONS" merged into "A18: I think oncology nurses should accurately identify adverse reactions after ONS, and take appropriate measures."K13: When the NRS-2002 score is greater than how many points need to formulate a nutrition plan?", replace "P2: For patients with abnormal screening, I will use appropriate evaluation tools to conduct a comprehensive evaluation of the patients, Objective and quantitative assessment of nutritional intake, nutritional impact symptoms, muscle mass, body weight and other conditions, and degree of systemic inflammation" is revised to "For patients with abnormal screening, I will use appropriate assessment tools to conduct a comprehensive nutritional status assessment of the patient Evaluation"; Amend "P13: I will add different kinds of condiments (such as juice, vegetable juice, honey, milk and salt, etc.) to the ONS agent according to the patient’s dietary habits and preferences" to "I will Underlying diseases, dietary habits and preferences, adding different kinds of condiments (such as juice, vegetable juice, honey, milk, and salt, etc.) to ONS agents". "P23: When the patient’s dietary intake reaches the recommended daily dietary intake and maintains good nutritional status, I will instruct the patient to discontinue ONS reasonably" to "When the patient’s dietary intake reaches the recommended daily dietary intake and maintains good nutritional status” I will instruct patients to gradually stop ONS when their nutritional status is not sufficient, and instruct them to use ONS in a timely manner when dietary intake is insufficient.” After the second round of inquiries,
the experts did not put forward new opinions, and the final initial questionnaire included 48 items, including 13 items in the knowledge dimension, 13 items in the belief dimension, and 22 items in the behavior dimension.

8 e) Reliability and validity test of the questionnaire

i. Research objects

Convenience sampling method was used to select nurses in the oncology department of five tertiary hospitals in Jiangsu Province as the research objects from March to April 2022. Inclusion criteria: Qualified as a nurse practitioner and engaged in front-line clinical work; working time in the oncology department > 1 year; voluntary participation in this study. Exclusion criteria: rotation, advanced study, practice nurses; those who are not at work due to illness, affairs, maternity leave, etc. According to the sample size of 5 to 10 times the number of items [9], the minimum sample size is 240 cases, and considering the dropout rate of 10%, this study finally included 270 subjects.

The questionnaires were collected by 2 uniformly trained research team members. The data is collected in the form of questionnaire stars, and the purpose, meaning and precautions of this questionnaire survey are introduced to the research subjects with a unified guide language; in order to avoid omissions, all items are set as mandatory items; in order to avoid invalid questionnaires, the research object with the same user and IP address can only be filled in once. After the questionnaire was collected, it was exported to excel, checked by two people, and the unqualified data were deleted.

ii. Project Analysis

9 a. Discrimination analysis method

The critical ratio decision value (CR) was used to test the discriminative degree and discriminating ability of the questionnaire. The questionnaire total scores of the research subjects were sorted from high to low, and the top 27% of the total scores were in the high group, and the last 27% were in the low group. The differences in the scores of each item between the two groups were compared, and the items with CR<3 and no statistically significant difference were deleted [10].

10 b. Correlation coefficient analysis method

By calculating the correlation coefficient of each item with the overall questionnaire and the scores of each dimension, the representativeness of each item is reflected, and the homogeneity of each item with the overall questionnaire and each dimension is judged. Items with a correlation coefficient < 0.40 with the overall questionnaire or the dimension to which it belongs are deleted [11].

11 c. Internal consistency reliability analysis method

Calculate the Cronbach’s ? coefficient of the overall questionnaire and each dimension, and then calculate the Cronbach’s ? coefficient of the overall questionnaire and each dimension after deleting each item. If the Cronbach’s ? coefficient of the questionnaire increases after removing an item, delete the item [9].

12 iii. Validity analysis

a. Construct validity

The construct validity of the questionnaire was tested by exploratory factor analysis and confirmatory factor analysis. Exploratory factor analysis: It is suitable for sampling appropriateness value (KMO) > 0.6 and the Bartlett sphericity test has a statistically significant difference (P < 0.05). Contribution rate > 40%; use the orthogonal rotation to maximize the variance to obtain the component matrix, and delete the entries with factor loading values < 0.40 [12]. Confirmatory factor analysis: using the maximum likelihood method for analysis; using the ratio of chi-square degrees of freedom (x2/df), root mean square error of approximation (RMSEA), incremental fit index (IFI), comparative fit index (CFI), Parsimony Adjustment Fit Index (PCFI), Goodness of Fit Index (GFI), Normative Fit Index (PNFI) and other results to analyze the rationality of the questionnaire structure; the reference standards for each index are x2/df<5.0, RMSEA <0.10, IFI>0.90, CFI>0.90, PCFI>0.50, GFI>0.90, PNFI>0.50 [13].

b. Content Validity

The 15 experts who originally participated in the Delphi letter inquiries were invited to evaluate the content validity of the revised questionnaire, using the Likert 4-point scoring method, with "1-4 points" indicating "very irrelevant", "irrelevant", "relevant", "very relevant". The content validity of the questionnaire was tested by the item-level content validity index (I-CVI) and the scale-level mean content validity index (S-CVI). It is generally believed that I-CVI>0.78 and S-CVI>0.9 indicate good content validity [14].

14 iv. Reliability Analysis

The Cronbach’s ? coefficient was used to analyze the internal consistency reliability of the overall questionnaire and each dimension, and the Cronbach’s ? coefficient was generally required to be >0.80; the questionnaire filling
results of 50 oncology nurses were re-collected after 2 weeks, and the correlation between the two questionnaire scores was tested. The test-retest reliability of the questionnaire generally requires a test-retest reliability > 0.70 [11].

f) Statistical methods

Double check and input data, SPSS 23.0 and Amos 23.0 were used for statistical analysis. Use mean and standard deviation, frequency and composition ratio to describe the general data of the research object; use two independent sample t test, Pearson correlation coefficient and Cronbach’s alpha coefficient method to analyze items and screen items of the questionnaire; use exploratory factor analysis and confirmatory Factor analysis was used to test the construct validity of the questionnaire; I-CVI and S-CVI were used to test the content validity of the questionnaire; Cronbach’s alpha coefficient and test-retest reliability coefficient were used to test the reliability of the questionnaire. P<0.05 was considered to be statistically significant.

II. Results

a) General information on nurses

A total of 265 valid questionnaires were collected in this study.

b) Project Analysis Results

i. Discrimination analysis method After the total score of the questionnaire was sorted from low to high, the total score of the 72nd and 193rd subjects was the critical value, and the total score > 134 was divided into the low group, and the total score ≤ 134 was divided into the high group. There was no significant difference in the items K3 (CR=1.025), K4 (CR=2.673), and K11 (CR=1.628) between the two groups (P>0.05). These three items were deleted. The CR values of the remaining items ranged from 4.366 to 12.758 with P<0.05.

ii. Correlation coefficient analysis method

The correlation coefficients of items K3, K4, K11 and the overall questionnaire are 0.108, 0.366 and 0.136, respectively, and the correlation coefficients with their knowledge dimensions are 0.215, 0.377 and 0.283, all <0.40, indicating that these three items are homogeneous with the questionnaire. Poor performance, consider deleting it. The correlation coefficients of the remaining items with the overall questionnaire ranged from 0.514 to 0.882, and the correlation coefficients with their knowledge, belief and behavior dimensions were 0.543 to 0.717, 0.577 to 0.748, and 0.754 to 0.893, respectively.

iii. Internal consistency reliability analysis method

The Cronbach’s alpha coefficients of the questionnaire population, knowledge dimension, belief dimension and behavior dimension were 0.958, 0.862, 0.942 and 0.972, respectively. After removing a certain item, the Cronbach’s alpha coefficients of the questionnaire population, knowledge dimension, belief dimension and behavior dimension were 0.765~0.911, 0.711~0.817, 0.793~0.887 and 0.823~0.925, respectively. None of the Cronbach’s alpha coefficients increased, indicating that each item made a greater contribution to the internal consistency of the questionnaire, and no item was deleted.

22) Validity analysis results

i. Construct validity a. Exploratory factor analysis

In this study, KMO=0.821, and the Bartlett test of sphericity was statistically significant (x² =9427.980, P<0.001), which was suitable for factor analysis. Factor loadings of 0.337 and 0.289 for entries K2 and K5, respectively, were removed after the variancemaximizing orthogonal rotation. After the entry was deleted, the second exploratory factor analysis was performed, KMO=0.883, and difference was statistically significant (x² =910.303, P<0.001); 5 common factors with eigenvalues>1 were extracted, and the cumulative variance contribution rate Among the five common factors, common factors 1 and 2 are classified as behavior dimensions, common factors 3 and 5 are classified as belief dimensions, and common factor 4 is classified as knowledge dimension, which is basically consistent with knowledge. The theoretical framework of Xinxing. The final questionnaire includes 43 items, including 8 items in the knowledge dimension, 13 items in the belief dimension, and 22 items in the behavior dimension. See Table ?? for details. The results of the exploratory factor analysis are shown in Table 2.

Table ??: Items of ONS Knowledge, Attitude and Action Questionnaire for Oncology Nurses.

Questionnaire Entries for Dimensions Knowledge K1: For cancer patients with normal gastrointestinal function, the preferred way to receive enteral nutrition is K6: When the oral intake of tumor patients during the perioperative period is less than the recommended target calories and protein, ONS should be given before surgery.
I will guide the patient to use ONS in time. I will guide the patient to gradually discontinue ONS; when the dietary intake is insufficient, 

When the dietary intake of the patient reaches the recommended amount of the daily diet and maintains a good 

status of ONS users, including body weight, BMI, albumin, prealbumin and other laboratory test indicators P23:

the implementation of ONS, and give guidance during the follow-up P22: I will regularly evaluate the nutritional 

usage, adverse reactions and possible causes, diet, etc. P21: I will follow up on ONS users regularly, focusing on 

months after discharge, and continue to pay attention to the nutritional status of the patients P20: I would 

postoperative radiotherapy and chemotherapy, I will guide the patients to continue ONS for 2 weeks to several 

questions during the ONS process, I will give timely guidance and help P17: I will deal with the patient’s 

personalized, easy-to-understand, and easy-to-operate nutrition education methods and approaches according 

to the ONS agent according to the patient’s underlying disease, eating habits and preferences P14: During 

the implementation of ONS, I will give patients and their families adequate nutritional guidance and education, 

mainly including the concentration, temperature and method of preparation; drinking method of preparation; 

target dosage of preparation; prevention and treatment of adverse reactions method etc. P15: I will adopt 

mainly including the concentration, temperature and method of preparation; drinking method of preparation; 

adenosine diphosphate to reduce the attack of ONS stimulation of the mucous membrane? K13: When the 

NRS2002 score is greater than the number of points, a nutrition plan needs to be developed. Attitude A1: I 

am interested in ONS-related knowledge and skills A2: I wish to receive professional training in ONS-related 

knowledge and skills A3: I think oncology nurses should pay attention to patients’ nutritional intake, nutritional 

impact symptoms, physical conditions and laboratory inspection indicators, etc., and use appropriate scales to 

tscreent patients for nutritional risk and comprehensively assess nutritional status. A5: I think ONS can help 

improve the nutritional status of cancer patients and even play an irreplaceable role in prolonging survival A8: 

I think the ONS standardized management process should be developed A9: I think oncology nurses should 

be proficient in methods to improve patients’ acceptance of ONS preparations A10: I think oncology nurses 

should be proficient in the formulation, energy density and preparation method of ONS preparations A13: I 

think oncology nurses should strengthen nutrition guidance and education for patients, mainly including the 

purpose and significance of ONS, preparation and drinking methods, prevention and treatment measures for 

adverse reactions, etc. A14: I think nutrition education should run through the whole process, explain the 

profound things in a simple way, be familiar and understandable, and reinforce it regularly A15: I think oncology 

nurses should regularly evaluate the efficacy of ONS. The evaluation indicators mainly include the patient’s body 

weight, BMI, albumin, prealbumin and other laboratory test indicators A16: I believe that nurses in the oncology 

department should strengthen the follow-up of patients with ONS, focusing on the implementation of the ONS 

treatment plan, the compliance of energy intake and the difficulties encountered in the implementation of ONS, 

and provide guidance during follow-up A17: I think oncology nurses should pay attention to the treatment and 

care of ONS in cancer patients and play an important role A18: I think oncology nurses should accurately identify 

adverse reactions after ONS and take appropriate preventive and treatment measures. Action P1: I will learn 

the knowledge and skills of ONS through various means (such as academic lectures, skills training and literature 

retrieval, etc.) P2: I will use an appropriate scale for nutritional risk screening of cancer patients P3: For patients 

with abnormal screening, I will use appropriate assessment tools to conduct a comprehensive assessment of the 

patient’s nutritional status P4: For cancer patients who are malnourished or at risk of nutrition, I will first give 

them intensive nutrition education P5: For cancer patients who are malnourished or at nutritional risk, when oral 

feeding cannot meet their nutritional needs, I will give ONS as soon as possible P6: ONS is my first choice for 

tenteral nutrition support for cancer patients with normal gastrointestinal tract function P7: For tumor patients 

who cannot eat normally for more than 5 days for elective surgery, I will encourage and guide their ONS before 

surgery P8: Before implementing ONS, I will inform patients of the nutritional assessment results and educate 

the purpose and significance of ONS, help them identify existing or potential nutritional problems, and improve 

patients and their caregivers’ awareness and acceptance of the importance of ONS P9: Before implementing 

ONS, I will encourage patients to participate in the setting of nutritional treatment goals P10: I will follow a 

step-by-step principle to guide cancer patients on ONS P11: For tumor patients with gastrointestinal symptoms 

such as loss of appetite, nausea and vomiting, I will first give appropriate symptomatic treatment as prescribed 

by the doctor P13: I will add different kinds of condiments (such as juice, vegetable juice, honey, milk and salt, 

etc.) to the ONS agent according to the patient’s underlying disease, eating habits and preferences P14: During 

the implementation of ONS, I will give patients and their families adequate nutritional guidance and education, 

mainly including the concentration, temperature and method of preparation; drinking method of preparation; 

target dosage of preparation; prevention and treatment of adverse reactions method etc. P15: I will adopt 

personalized, easy-to-understand, and easy-to-operate nutrition education methods and approaches according 

to the patient’s age, education level, and psychological status. P16: When patients encounter difficulties or 

questions during the ONS process, I will give timely guidance and help P17: I will deal with the patient’s 

gastrointestinal intolerance, abnormal blood sugar and other adverse reactions by appropriately adjusting the 

concentration, temperature, dosage and drinking method of ONS, and selecting special preparations. P18: If 

the patient’s gastrointestinal intolerance symptoms cannot be relieved by properly adjusting the concentration, 

temperature, dosage and drinking method of ONS, I will suspend ONS first, and the doctor or nutritionist will 

change the type of ONS preparation P19: For tumor patients with severe malnutrition, major surgery, and 

postoperative radiotherapy and chemotherapy, I will guide the patients to continue ONS for 2 weeks to several 

months after discharge, and continue to pay attention to the nutritional status of the patients P20: I would 

courage ONS users to record their daily ONS usage in a diary or table, including the time and amount of ONS 

usage, adverse reactions and possible causes, diet, etc. P21: I will follow up on ONS users regularly, focusing on 

the implementation of the ONS treatment plan, the energy intake standard and the difficulties encountered in 

the implementation of ONS, and give guidance during the follow-up P22: I will regularly evaluate the nutritional 

status of ONS users, including body weight, BMI, albumin, prealbumin and other laboratory test indicators P23: 

When the dietary intake of the patient reaches the recommended amount of the daily diet and maintains a good 

nutritional status, I will guide the patient to gradually discontinue ONS; when the dietary intake is insufficient, 

I will guide the patient to use ONS in time. 

P2 0.860

P8 0.850

P5 0.850

P9 0.838

P3 0.835

P6 0.815

P7 0.812

P11 0.809

P4 0.804

P1 0.724

P15 0.543
29 B) THE SCIENTIFIC PREPARATION PROCESS OF THE ONS QUESTIONNAIRE FOR ONCOLOGY NURSES

P19 - 0.832 - - P18 - 0.806 - - P20 - 0.793 - - P17 - 0.777 - - P21 - 0.771 - - P22 - 0.771 - - P16 - 0.612 - - P23 - 0.595 - - P13 - 0.558 - - P14 - 0.545 - - A1 - 0.935 - - A17 - 0.926 - - A2 - 0.921 - - A3 - 0.913 - - A5 - 0.909 - - A16 - 0.854 - - A14 - 0.801 - - A15 - 0.611 - - - 0.883 - K6 - - 0.881 - K13 - - 0.874 - - K7 - - 0.794 - K9 - - 0.727 - K10 - - 0.702 - K8 - - 0.589 - K12 - - 0.511 - A13 - - - 0.816 A18 - - - - 0.752 A8 - - - - 0.694 A9 - - - - 0.

24 ii. Content Validity

The I-CVI of each item of the questionnaire was 0.832-1.000; the overall S-CVI of the questionnaire was 0.914; the S-CVI of the knowledge dimension, belief dimension and behavior dimension of the questionnaire were 0.903, 0.911 and 0.925, respectively.

25 d) Reliability Analysis Results

The Cronbach’s alpha coefficients of the overall questionnaire, knowledge dimension, belief dimension and behavior dimension were 0.958, 0.862, 0.942 and 0.972, respectively; the test-retest reliability of the overall questionnaire, knowledge dimension, belief dimension and behavior dimension were 0.978, 0.761, 0.962, 0.985, respectively.

26 e) Final Questionnaire of ONS Knowledge, Attitude and Practice of Oncology Nurses

The final questionnaire consists of 43 items, including 8 items in the knowledge dimension, including 3 multiple-choice questions and 5 multiple-choice questions. A correct answer to a multiple-choice question is worth 1 point, a wrong answer is 0 points, and a multiple-choice question is answered correctly. 1 option Score 1 point, wrong answer is 0 point, the scoring range is 0–4 points; there are 13 items in the belief dimension, using Likert 5-point scoring method, "1~5 points" respectively means "strongly disagree" and "disagree" "Not sure", "agree", "strongly agree", the scoring range is 1-5 points; there are 22 items in the behavior dimension, using the Likert 5-point scoring method, "1-5 points" represent "never" and "occasionally" respectively "Sometimes", "Often" and "Always" on a scale of 1 to 5. The overall score of the questionnaire ranged from 35 to 198, with higher scores indicating better knowledge, beliefs and behaviors of ONS nurses.

27 III.

28 Discussion

a) It is of great significance to compile the ONS Knowledge, Attitude and Action Questionnaire for Oncology Nurses. Rational nutritional support has significant benefits in remission, quality of life and prognosis of cancer patients [15]. ONS is a safe, convenient, cost-effective and effective nutritional treatment measure. The European society for clinical nutrition and metabolism (ESPEN) [16], the Chinese society for parenteral nutrition and enteral nutrition, CSPEN [17] both recommend ONS as the first choice for nutritional therapy. The intake of ONS requires the active cooperation of patients, and its efficacy depends on the patient’s compliance [7]. Nursing staff are the main contacts of patients during hospitalization and play a key role in the implementation and management of ONS. Expert consensus [5] pointed out that insufficient attention and non-standard implementation of ONS by nursing staff will reduce patients’ compliance with ONS and affect the treatment effect. Nursing staff should be proficient in the implementation of ONS and translate it into practical actions, which is conducive to improving patients’ compliance with ONS and enhancing its efficacy. Good behavior is based on correct knowledge and positive attitudes and beliefs [18]. Understanding the current status of oncology nurses’ knowledge, beliefs, and behaviors about ONS can help improve their clinical execution. Therefore, it is very necessary to compile relevant questionnaires to provide a reliable evaluation tool for a comprehensive and objective understanding of oncology nurses’ knowledge, belief, and behavior level of ONS, and to provide a basis for targeted training and management decisions.

29 b) The scientific preparation process of the ONS questionnaire for oncology nurses

Based on the theory of knowledge, belief, and action, this study constructed an initial item pool of the questionnaire according to relevant domestic and foreign literature, covering ONS pre-use assessment, scope of application, formulation selection, use risk assessment, efficacy evaluation, and health education. The relevant content of ONS is comprehensively included to ensure the standardization of the questionnaire items. This study adopts the Delphi method to invite clinical nursing, nursing management and nursing education experts with high academic level, solid theoretical foundation and rich clinical experience in the field of ONS to revise the initial item pool of the questionnaire; The recovery rate is 100%, and the authoritative coefficients of the experts in the two rounds of correspondence are 0.893 and 0.921 respectively, indicating that the experts have high enthusiasm and authority, and can make professional judgments and make valuable suggestions for each
item, which ensures that the experts are highly motivated and authoritative. The rigor of the letter inquiry process and the reliability of the letter inquiry results; the research team revised and improved the questionnaire according to expert opinions, which ensured the rationality of the questionnaire items. In this study, statistical methods such as discrimination analysis method, correlation coefficient analysis method and internal consistency reliability analysis method were used to screen the questionnaire items, try to avoid the deviation caused by the selection of items by a single method, and ensure the representativeness and reliability of the questionnaire items. Sensitivity. In this study, the questionnaire was pre-investigated to test its reliability and validity, which ensured the stability and validity of the structure and content of the questionnaire.

c) The ONS Knowledge, Attitude and Action Questionnaire for Oncology Nurses has good reliability and validity. Reliability reflects the consistency of evaluation tools, that is, whether the evaluation tools can stably evaluate the measured variables. The overall Cronbach’s ? coefficient of the questionnaire prepared in this study was 0.958, and the Cronbach’s ? coefficient of each dimension was 0.862-0.972, all >0.80, indicating that the questionnaire had good internal consistency. The test-retest reliability of this study was 0.978, and the test-retest reliability of each dimension was 0.761-0.985, all >0.70, indicating that the questionnaire has good stability and consistency across time. Validity refers to the degree to which the assessment tool reflects the expected research concept, that is, the correctness and validity of the questionnaire [12]. After 2 rounds of exploratory factor analysis, this study extracted 5 common factors, the cumulative variance contribution rate was greater than 40%, and the factor loading of each item was greater than 0.4, indicating that the questionnaire was basically consistent with the theoretical structure of the questionnaire; the confirmatory factor analysis results showed that , x2/df < 5.00, RMSEA < 0.10, IFI, CFI, GFI are > 0.90, PCFI, PNFI are > 0.50, all fitting indicators are in the acceptable range, indicating that the model fits well. The above results show that the questionnaire has good construct validity. The overall S-CVI of the questionnaire in this study is 0.914, the S-CVI of each dimension is 0.903-0.925, all > 0.90; the I-CVI of each item is 0.832-1.000, all > 0.78, indicating that the content of this questionnaire can reflect the current status of ONS knowledge, belief, and behavior among nurses in the oncology department has good content validity.

IV. Conclusion
The ONS knowledge, belief, and behavior questionnaire for oncology nurses prepared in this study has good reliability and validity. It can be used as a scientific tool to assess the current status of ONS knowledge, belief, and behavior of oncology nurses, and provides a theoretical basis for carrying out targeted training programs and formulating scientific management strategies. Due to limited conditions, this study only investigated five tertiary first-class hospitals in Jiangsu Province, and the generalizability of the questionnaire was limited. In the future, the sample size will be increased and expanded to hospitals in multiple regions and levels to further verify and improve the questionnaire.

<table>
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<th>Questionnaire items</th>
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Figure 1: Table 2:
.1 Data Availability

The experimental data used to support the findings of this study are available from the corresponding author upon request.

.2 Conflicts of Interest

The authors declared that they have no conflicts of interest regarding this work.

.3 Funding Statement

There is no specific funding to support this research.

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CONCLUSION

