

Knowledge about precautions in Primary Health Care: tool validation

Conhecimento sobre precauções na Atenção Primária à Saúde: validação de instrumento
Conocimiento sobre precauciones en la Atención Primaria a la Salud: validación de instrumento

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ABSTRACT

Objective To elaborate and validate a tool to assess knowledge and behavior of nursing professionals about standards and specific precautions in the Primary Health Care. **Method:** Methodological study of the elaboration and validation of the tool by thirteen experts judges, using a Likert scale of 4 points, with Content Validity Index ≥ 0.80 , on clarity, relevance and pertinence. **Results:** A tool composed of 47 dichotomous questions to assess knowledge and 12 questions, with five options of answers, for the referred behavior. In the validation, only one item was deleted, related to the "Hands Hygiene" axis and one item was reformulated, regarding "Use of Common Gloves" and another 11 changed writing. The tool as a whole was assessed for relevance, comprehensiveness and representativeness within the scope of the topic investigated. **Conclusion:** The developed tool has been validated and is now available for use in Primary Health Care.

Descriptors: Primary Health Care; Universal Precautions; Validation Studies; Nursing; Continuing Education in Nursing.

RESUMO

Objetivo: Elaborar e validar instrumento para avaliação do conhecimento e comportamento referido dos profissionais de enfermagem sobre precauções padrão e específica na Atenção Primária à Saúde. **Método:** Estudo metodológico de elaboração e validação do instrumento, por treze juízes especialistas, por meio de escala tipo *Likert* de 4 pontos, com Índice de Validade de Conteúdo $\geq 0,80$, sobre clareza, relevância e pertinência. **Resultados:** Instrumento composto por 47 perguntas dicotômicas para avaliar o conhecimento e 12 perguntas, com cinco opções de respostas, para o comportamento referido. Na validação, apenas um item foi excluído, relativo ao eixo "Higiene das mãos" e um item foi reformulado, relativo a "Uso de luvas" e outros 11 passaram por alteração de redação. Foi avaliado o conjunto do instrumento quanto à relevância, abrangência e representatividade dentro do escopo do tema investigado. **Conclusão:** A ferramenta desenvolvida foi validada e está agora disponível para uso na Atenção Primária à Saúde.

Descritores: Atenção Primária à Saúde; Precauções Universais; Estudos de Validação; Enfermagem; Educação Continuada em Enfermagem.

RESUMEN

Objetivo: Elaborar y validar instrumento para evaluación del conocimiento y comportamiento referido de los profesionales de enfermería sobre precauciones estándar y específica en la Atención Primaria a la Salud. **Método:** Estudio metodológico de elaboración y validación del instrumento, por trece jueces especialistas, por medio de escala tipo *Likert* de 4 puntos, con Índice de Validez de Contenido $\geq 0,80$, sobre claridad, relevancia y pertinencia. **Resultados:** Instrumento compuesto por 47 preguntas dicotómicas para evaluar el conocimiento y 12 preguntas, con cinco opciones de respuestas, para el comportamiento referido. En la validación, sólo un ítem fue excluido, relativo

al eje "Higiene de las manos" y un ítem fue reformulado, relativo a "Uso de guantes" y otros 11 pasaron por alteración de redacción. Se evaluó el conjunto del instrumento en cuanto a la relevancia, alcance y representatividad dentro del alcance del tema investigado. **Conclusión:** La herramienta desarrollada ha sido validada y está ahora disponible para su uso en la Atención Primaria a la Salud. **Descriptores:** Atención Primaria a la Salud; Precauciones Universales; Estudios de Validación; Enfermería; Educación Continua en Enfermería.

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INTRODUCTION

Improved patient safety and health service quality with focus on reducing Healthcare Associated Infections (HCAI) have received special attention since they are considered a major public health challenge in Brazil and globally⁽¹⁻²⁾.

Among the ways of prevention of HCAI enshrined worldwide, is the adoption of measures known as Standard Precautions (StanP) and Specific Precautions (SpeP)⁽³⁻⁴⁾, which aim to reduce the risk of transmission of microorganisms to patients and professionals. StanP is a measure that should be used with all patients regardless of the occurrence of a suspected or confirmed diagnosis, and includes Hands Hygiene (HH), use of Personal Protective Equipment (PPE), respiratory label, physical area care, environment and waste management⁽⁵⁻⁷⁾. SpeP is an additional measure that should be used when StanP is not enough to stop the transmission of pathogens through contact, droplet or aerosol. In Primary Health Care (PHC), the most common situations requiring SpeP are: pulmonary or laryngeal tuberculosis and varicella (aerosols), influenza (droplets), scabies and multiple drug resistant microorganisms (contact)⁽⁵⁾.

It is well known that adherence to such measures is still a challenge among health professionals⁽⁸⁻⁹⁾. This study points out that some professionals do not agree or disregard the recommendations of preventive measures besides not recognizing the moment in which they must carry out them⁽¹⁰⁾. In another study, the authors found that the professionals studied, when questioned, reported adherence to HH but in the systematic observation of the practice, this was not confirmed⁽¹¹⁾.

These studies⁽⁹⁻¹¹⁾ were mostly performed in the hospital setting. In PHC, however, this risk of HCAI is unknown, which is considered concerning, since it is one of the great entry points of the health system in the country, in addition to the diversity of actions that take place there. Performing invasive procedures, such as administration of medication, vaccination and dressings, is part of the PHC routine; the control and search of patients with infectious diseases such as tuberculosis; in addition to the first outbreak care, such as influenza A, for example⁽⁵⁾. Another situation that is increasingly frequent and still little investigated, but observed empirically, is the transfer of care from patients who are discharged from hospital with multiple drug resistant microorganisms and continue their care in PHC.

The present study was based on a previous study carried out with PHC professionals, where low perception of infection risk was identified, lack of specific training in the subject, infrastructure limitations and knowledge gaps, particularly on HH, tuberculosis and manipulation of sharps at home⁽¹²⁾. The achievement of this is also justified by the relevance of HCAI transmission in PHC, the rare epidemiological reports on this

population⁽⁵⁾, the acknowledged deficit of adherence to StanP and SpeP by health professionals in general⁽¹¹⁾, the difficulty of comparison between the results of the few recent studies in this care setting⁽¹²⁻¹⁶⁾ and the limited availability of assessment tools⁽¹⁷⁻¹⁸⁾, which have not yet been validated.

OBJECTIVE

To elaborate and validate a tool for the assessment of knowledge and behavior reported by the nursing professionals on StanP and SpeP in PHC.

METHOD

Ethical aspects

The project was approved by the Research Ethics Committee of the *Universidade Federal de São Carlos - UFSCar*, according to Ordinance 466/12 of the National Health Council (*Conselho Nacional de Saúde- CNS*) and the participants signed the Informed Consent Form.

Design, place of study and period

This is a quantitative and methodological development study that describes the steps for the elaboration and validation of a tool to assess knowledge and behavior reported by nursing professionals on StanP and SpeP in PHC.

The results of the methodological research can support the theoretical formulation for the elaboration of an assessment methodology, being a facilitator when approaching the empirical data to the practice with the attainment of greater concreteness⁽¹⁹⁾. The study was carried out in a municipality in São Paulo State's countryside, from July 2015 to May 2016.

Population and criteria for inclusion and exclusion

The selection of judges occurred intentionally and not probabilistically. Twenty-seven nurses who met one of the following inclusion criteria were invited: minimum two-year professional experience in PHC care; minimum professional experience of two years and/or specialization in infection control; be a researcher in the Nursing area at PHC or in infection control. Thirteen nurses, from São Paulo State participated in the study, of which 11 were women, with a mean age of 35.1 years; average professional training time of 11.8 and average of 11 years. All of them had graduation degrees, of which six (46.1%) had a master's degree, six (46.1%) had a doctorate and one (7.7%) had specialization in research-related areas. The tool for content validation was sent to the 13 judges, followed by a letter clarifying the research objectives and the Informed Consent Form.

Study protocol

Establishment of the conceptual framework

The development of the tool was based on a previous study⁽¹²⁾, where knowledge gaps and interference or contribution factors were identified with adherence to the StanP, through focus groups with PHC health professionals.

The use of the experience of the target population, such as that obtained through the focal group, is recognized in the literature as an important source of material for the development of tools⁽²⁰⁾.

In possession of this material, the concepts that would be addressed (operational definitions of the construct) were defined, in order to meet the objective of the tool. Already for its theoretical support, the following references were used:

- *Guide to infection prevention in outpatient settings: minimum expectations for safe care*⁽³⁾. This is a synthesized guide of recommendations for infection prevention in an out-of-hospital environment. In general, the material reaffirms the adoption of StanP as a foundation for the prevention of transmission of infectious agents during patient care in all health care settings, and that the adoption of these measures represents the minimum expectations of infection prevention for safe ambulatory care.

- *Hands hygiene in extra-hospital and home healthcare and in long-term care institutions*⁽²¹⁾. It is known that best practices and strategies to improve hands hygiene are golden rules for global health. However, there are still few studies that assess the risk of microorganism transmission and the impact of implementing hands hygiene concepts in these locations. With these issues in mind, a World Health Organization (WHO) team from the "Clean Assistance is Safer Care" initiative organized the manual addressing the following key issues: 1) risk of transmission of microorganisms and infection, especially by hands, in out-of-hospital care settings; 2) practices of hands hygiene in these places; 3) adaptation of the patient's environment and the "My 5 moments for hands hygiene" approach and 4) implementation of improvement strategies at institutional level.

Tool elaboration

The construction of each item of a questionnaire should be carefully monitored to ensure clarity, objectivity, simplicity, accuracy, relevance and absence of deviations⁽¹⁹⁻²⁰⁾. For that, the grouping of themes established in the conceptual structuring was followed, so that the tool contemplated all the topics listed.

The final tool developed, therefore, is composed of two modules, and Module A, through hit rates of the questions on precautions, aims to assess knowledge of the professional on the subject. This module is composed of five axes, one for each priority theme, in a total of 48 dichotomous questions with two choices, right or wrong. On the other hand, Module B aims to assess the frequency of good practice behavior on standard and specific precautions in everyday work situations. This module contains 12 Likert five-point scale questions, the answer options being: 5- Always; 4- Very Frequent; 3 - I Do Not Remember; 2- A Few Times; 1- Never.

An Operation Manual was also developed to guide the user about the use of the tool, containing the correct alternative, as well as a theoretical rationale introducing the subject and justifying the correct answer, in order to facilitate the understanding and use of the material.

Next, the tool was thoroughly discussed by peers in a research group meeting, for further referral to the experts judges for validation.

Only for the assessment of the judges was added the module C, composed of a dichotomous question that assessed the adequacy of the language to the intended audience, and six dichotomous questions, which objectified the relevance, comprehensiveness and representativeness of the questionnaire in general.

Regarding the assessment of the index of responses, it is considered that the ideal is 100% correct. Different scores of this indicate how much the professional's knowledge distances from the expected.

Tool validation

According to the literature⁽¹⁹⁻²⁰⁾, the content validation stage must be carried out by a group of at least five to ten experts judges in the area of the measuring tool.

In this study, 13 judges participated in the content validation stage selected considering the experience and the high degree of knowledge of the same on the subject. The identification of these judges occurred by indication, snowball type, where contacted researchers indicated others renowned in the theme. The initial contact was by electronic mail where the objective of the work and the criteria for its appointment as judge were presented. If they agreed to participate, the Free and Informed Consent Form, along with the procedure and specific guidelines for validation, were also sent electronically.

All the judges were nurses, living in São Paulo State, 11 of them were women; mean age was 35.1 years; average professional training time of 11.8 and median of 11 years (minimum of 3 and maximum of 28 years). All of the participants have graduation degrees, six (46.1%) with a master's degree, six (46.1%) with a doctorate and one (7.7%) with specialization in the research-related areas, in other words, PHC, infection control or infectious diseases.

We have performed (face) apparent and content validations to guarantee the psychometric properties of each item of the tool.

The apparent validation assesses the relevance and adequacy of language, especially according to the target audience of application of the tool. Content validity, however, consists of evaluating whether the tool covers the entire content domain and the extent to which the issues are related to the subject. It is based on a judgment and often the use of a group of independent experts is often evidenced to assess the validity of new tools⁽¹⁹⁾.

The judges used a 4-point Likert scale, being: I strongly agree (4); I agree partially (3); I disagree partially (2) and I totally disagree (1), assesses each item of the tool for clarity, relevance and pertinence, in addition to the possibility of suggestions for redrafting. For the overall assessment of the material, the items relevance, clarity and representativeness of the tool set were assessed by dichotomous questions with two options of response yes (2) or no (1). The Content Validity Index (CVI) considered was 0.80, in order to obtain a consensus level of 80%, an index recommended by a review study available in the literature⁽²⁰⁾.

Analysis of results and statistics

The answers were entered in a Microsoft Excel® System worksheet and for the validation of the components, in Modules A

and B, options (3) and (4) were added as favorable, and options (1) and (2) as necessary reformulation or exclusion; in Module C options 2 were grouped for favorable and 1 for reformulation or deletion of the component. In all modules, for the component to be considered validated, it should reach the CVI greater than or equal to 0.80 for the favorable option.

RESULTS

Module A of the tool developed - *Assessment of the hit rates for standard and specific precautions* - includes five axes, namely A1. Identification of risks; A2. Hands hygiene; A3. Use of common gloves; A4. Use of mask and cough etiquette and A5. Safe medication and sharps disposal, to assess the professional's knowledge on the subject, in a total of 48 dichotomous questions.

In the validation of Module A, only two questions, in the Hands Hygiene and Glove Use axes, obtained CVI < 0.80, both with CVI of 0.77 in the Clarity and Relevance aspects. After evaluating the comments issued by the judges, we opted for the exclusion of A2.4, considering that this could generate conceptual misunderstandings and the reformulation of A3.11 leaving the sentence more objective (Chart 1).

Chart 1 – Components of the tool excluded or reformulated post-validation by CVI (Content Validity Index)* < 0.80, São Carlos, São Paulo State, Brazil, 2017

Tool item	Content of the issue	Conduct
A2.4	In case of contact of the health professional with objects or surfaces used by the user, hands hygiene should only be performed after this contact, in order to prevent the transmission of microorganisms to other people. <i>Answer: Incorrect.</i>	Excluded
A3.11	To carry out simple dressing the use of latex gloves is indispensable, independent of the use or not of clamps. <i>Answer: Incorrect. (Already with the new essay)</i>	Reformulated

Still in Module A, 11 other items, in spite of having obtained CVI > 0.80, received suggestions of changes of writing, in order to give greater clarity to them, and these were accepted. The final module was composed of 47 items, distributed in the five axes, according to Chart 2.

Module B - *Assessment of the frequency of good practices in behavior regarding standard and specific precautions*, in turn, is composed of 12 questions with five Likert type response options, ranging from "never" to "always". All of these questions, which assess the behavior of the professional when faced with daily work situations, obtained CVI > 0.80 and were therefore validated. There was only suggestion of inversion in the order of writing of only one item (B1.2).

Chart 2 – Final composition of Module A of the tool regarding validated and adapted items, São Carlos, São Paulo State, Brazil, 2017

Axes	Number of proposed items	Number of validated items	Items that have been adapted in the essay
A1. Risk identification.	6	6	2 (A1.2, A1.6)
A2. Hands hygiene.	15	14	4 (A2.6, A2.7, A2.8 e A2.9)
A3. Use of gloves for procedures.	11	11	3 (A3.5, A3.9, A3.11)
A4. Use of masks and cough etiquettes.	11	11	-----
A5. Safe Medication and sharps disposal.	5	5	2 (A5.1, A5.5)

In the overall assessment, the whole of the tool and its axes, Module C, were considered adequate for clarity, pertinence and representation within the theme by 100% of the judges and therefore considered valid (Chart 3).

Chart 3 – Overall assessment of the questionnaire, regarding relevance, comprehensiveness and representativeness, according to the opinion of judges, São Carlos, São Paulo State, Brazil, 2017

	Relevance (CVI*)	Comprehensiveness (CVI*)	Representativeness (CVI*)
1 – The tool as a whole.	1.0	1.0	1.0
2 – Axis Risk identification.	1.0	0.8	1.0
3 – Axis Hands hygiene.	1.0	1.0	1.0
4 – Axis Use of common gloves.	1.0	1.0	1.0
5 – Axis Use of masks and cough etiquette.	0.9	0.9	0.9
6 – Axis Safe medication and sharps disposal.	0.9	0.9	0.9

Note: *CVI Content Validity Index.

After the validation and final writing of the tool, the Operational Manual was elaborated, which discusses the essence of

each axis, presents the template of the items and the reference used for the theoretical basis of the question. The tool and the instructions for its application contained in the Operation Manual are available from the authors of the study.

DISCUSSION

The elaborated tool aggregates the points identified as critical by the professionals participating in the PHC focus groups, in a step prior to this study, conferring an identity with the reality experienced by these, empowering the questionnaire.

It is believed that the origin of the content, coupled with the exhaustive discussion in the research group, until reaching the version sent to the judges, may have contributed to the high acceptance rate of the tool in the validation process. Recalling that in the tool as a whole there was only one item in the Hands hygiene axis (A2.4) and minor essay changes in another twelve.

The use of more than one parameter for assessment, that is, the degree of knowledge and the behavior referred to extends the scope of the tool, since it is a subject of great complexity and requires numerous approaches.

This study shows that despite the high level of knowledge and training on the subject, found in the study population, the mentioned behavior indicated that professionals recognize failures to adhere to precautions⁽²²⁾.

It is known that knowledge on the subject is the basis for the adhesion process, but it is considered that other factors, such as social influence, attitudes, intentionality, institutional barriers can affect this practice⁽²³⁾.

The final tool, after validation, has two modules, the A and the B. The module A, with 47 dichotomous questions divided into five axes, assesses the knowledge of the professional on the subject; the B, with 12 Likert five-point questions assesses the reported frequency of good practice behavior on standard and specific precautions in everyday work situations. In addition to the tool, there is also an Operation Manual in order to guide the user about the tool.

In module A, only two questions obtained CVI < 0.80, in the axes "Hands hygiene" and "Use of gloves", one being excluded and the other reformulated.

It is known that HH is essential for reducing the risk of transmitting microorganisms in both the hospital and outpatient settings. Approximately 30% of HCAs may be preventable by basic measures such as HH^(3,21). However, in view of the available national and international literature on HH, low compliance with established practices is evident, jeopardizing both user and professional safety^(8,11). In the extra-hospital environment, these data are still incipient⁽¹³⁻¹⁸⁾.

A Spanish study, carried out at PHC and in a hospital environment, found gaps in the knowledge of health professionals regarding the concept of hands hygiene and the use of alcohol solution⁽¹⁶⁾. In a Brazilian study, a low HH index was identified in PHC before procedures such as colposcypological and curative exams, with 16.6% and 50%, respectively; and 50% in both⁽¹⁵⁾, which corroborates with those found in other studies, where the time of greatest adhesion to HH is after the procedure⁽²⁴⁻²⁵⁾.

The lack of adherence to HH's worldwide practice has been registered in other countries, such as Spain, where studies are also rare in the PHC, but it is known that the HH adherence rate in the hospital environment varies between 30 and 50 %. A study carried out at the PHC in Madrid, where adherence to HH was observed at the five points indicated by the World Health Organization (WHO), resulted in a value of 8.1% of adherence⁽¹³⁾.

In Nigeria, a study showed that nurses demonstrated good knowledge regarding infection control, but did not reflect on the level of adherence to practices⁽²⁶⁾.

It is clear that greater attention should be directed to measures that corroborate to improve adherence to HH, including PHC. The identification of gaps in knowledge and behavior, through this tool, can more accurately indicate themes for future educational interventions.

Regarding the use of gloves, the use of these gloves is recommended by the WHO as a barrier in reducing the risk of infection and should be used during all user assistance in which exposure to blood, other body fluids, contact with mucous membranes or skin not intact and to outbreak situations. In several clinical studies, the efficacy of gloves has been demonstrated to reduce the risk of contamination of the hands of health professionals and transmission of pathogens⁽³⁾.

This theme was used as the axis for this study due to the presence of failures in adherence to this precautionary measure, or its misuse already described in the literature⁽²⁷⁾.

The use of latex gloves by health professionals during the care visits was observed in 66.3% of the situations in which they should have been used, being more evident in the Capillary Blood Glucose Test, where it was used only in 14% of the opportunities⁽²⁵⁾. In dressings, it was used 100% of the time, but in 66.7% they were not used in conjunction with tools and after dressing were kept for other care in the user. In a hospital setting, another study identified the inadequate use of gloves, either by their unnecessary use or by using the same glove in different places of the same patient or in different patients⁽²⁷⁾.

The use of validated tools in a topic that is so relevant and specific to the PHC scenario is of great importance to broaden and qualify the knowledge produced in this context. To this end, the availability of validated tools for this purpose is essential. The studies of tool construction and validation are important, since, when validated, they give scientific character to the tools⁽²⁸⁾.

Study limitations

It is known that content validation is an important step in the development of new measurement tools; however, it is recognized the need for additional psychometric measures, such as new studies that assess the applicability of the same.

Contributions to the sectors of Nursing, Health or Public Policy

In Brazil, to date, there are no large scale studies aimed at instituting and analyzing strategies that aim to increase adherence to PHC precautionary practices. The current studies have been applied individually in hospital units.

The production of this tool is considered a great advance in the area of knowledge, since there is not a validated material available similar, specific, for the PHC. This adds the points considered critical by professionals, which confers an identity with the reality experienced by the authors and literature, empowering the tool.

CONCLUSION

It is concluded that the proposed tool, considering the axes: risk identification; hands hygiene; use of common glove; use of mask and cough etiquette and safe medication and sharps disposal for assessment of professional knowledge and behavior

regarding adherence to precautions has been validated by judges and is available for use at PHC.

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