



# Self-confidence for the initial management of health issues in schools: construction and validation of a visual analogue scale

*Autoconfiança para o manejo inicial das intercorrências de saúde na escola: construção e validação de uma escala visual analógica*

*Autoconfianza para gestionar complicaciones sanitarias en la escuela: construcción y validación de escala visual analógica*

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## ABSTRACT

**Objective:** To describe the construction and validation of a visual analogue scale of teachers' self-confidence with regard to the initial management of health issues in schools. **Method:** A methodological study was developed based on theoretical (items' construction and content validation), empirical (semantic analysis and pilot test), and analytical procedures (internal consistency analysis). The project was approved by a research ethics committee. **Results:** The scale consisted of 12 items regarding the main health issues in schools, presented content validity index of 100% in the second round, was understood by the target audience, and presented high internal consistency among items (Cronbach's alpha of 0.89). **Conclusion and implications for practice:** An easy-to-use tool that proved to be relevant to meet the dimension of teachers' self-confidence in the initial management of health issues in schools. The scale may contribute to the planning of systematized and effective educational strategies among teachers.

**Keywords:** School Health; Nursing; First Aid; Validation Studies; Visual Analog Scale.

## RESUMO

**Objetivo:** Descrever a construção e validação da escala visual analógica de autoconfiança dos professores com relação ao manejo inicial das intercorrências de saúde na escola. **Método:** Estudo metodológico desenvolvido a partir do procedimento teórico (construção dos itens e validação do conteúdo), empírico (análise semântica e teste piloto) e analítico (análise de consistência interna). Projeto aprovado pelo Comitê de Ética em Pesquisa. **Resultados:** Escala constituída por 12 itens referentes as principais intercorrências de saúde na escola, índice de validação de conteúdo de 100% na segunda rodada, compreensível pelo público-alvo e com alta consistência interna entre os itens ( $\alpha$  de Cronbach 0.89). **Conclusão e implicações para a prática:** Ferramenta de fácil utilização que mostrou-se pertinente para atender a dimensão da autoconfiança dos professores no manejo inicial das intercorrências de saúde na escola. A escala pode contribuir no planejamento de estratégias educativas sistematizadas e efetivas entre os professores.

**Palavras-chave:** Saúde Escolar; Enfermagem; Primeiros Socorros; Estudos de validação; Escala Visual Analógica.

## RESUMEN

**Objetivo:** Describir la construcción y validación de la escala visual analógica de autoconfianza de profesores respecto a la gestión inicial de problemas de salud en la escuela. **Método:** Estudio metodológico desarrollado a partir del procedimiento teórico (construcción de ítems y validación del contenido), empírico (análisis semántico y prueba piloto) y analítico (análisis de consistencia interna). Proyecto aprobado por Comité de Ética en Investigación. **Resultados:** Escala integrada por 12 ítems referentes a las principales complicaciones de salud en la escuela, índice de validación de contenido de 100% en segunda rueda, comprensible por público objetivo y con alta consistencia interna entre los ítems ( $\alpha$  de Cronbach 0.89). **Conclusión e implicancias para la práctica:** Herramienta de fácil uso, adecuada para atender la dimensión de autoconfianza de docentes en gestión inicial de complicaciones sanitarias en la escuela. Puede contribuir al planeamiento de estrategias educativas sistematizadas y efectivas entre los docentes.

**Palabras clave:** Salud Escolar; Enfermería; Primeros Auxilios; Estudios de Validación; Escala Visual Analógica.

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## INTRODUCTION

Health issues, whether due to illnesses or accidents, are common in the school environment because of children's length of stay at schools and engagement in recreational activities.<sup>1-3</sup> At schools, children are exposed to falls, injuries, bruises, drowning, and burns, in addition to presenting clinical conditions due to illnesses of the childhood itself, such as fever, convulsions, and syncope.<sup>4</sup> In this respect, schools represent a space of significant contribution to the implementation of accident prevention actions, as well as first aid assistance.<sup>4-8</sup>

First aid is understood as the first actions carried out by individuals who may be healthcare professionals or not, with the purpose of providing help someone in pain or at risk of death.<sup>9</sup> It is the management of any injury or illness before the availability of qualified healthcare professionals, with the aim of preventing worsening, ensuring recovery, minimizing complications, and preserving and saving lives.<sup>3,10</sup> Therefore, the present study adopted the terms "first aid" and "initial management of health issues" as synonyms.

In the national and international school context, the initial management of health issues is often carried out by teachers.<sup>11-13</sup> However, there are gaps regarding their training in the face of health issues.<sup>1,2</sup> The international literature corroborates this fact when identifying low knowledge levels with regard to first aid in its results.<sup>12,13</sup> In this perspective, several feelings may be maximized by the lack of knowledge, such as insecurity, fear, and nervousness.<sup>5</sup> According to one recent study carried out in Korea, these feelings undermine teachers' self-confidence.<sup>14</sup>

Self-confidence is understood as individuals' perspective of feeling secure and expressing conviction with regard to their own skills.<sup>15</sup> Self-confidence combined with previous experiences and knowledge contributes to successful actions.<sup>16</sup> Self-confidence is a key element for an appropriate performance in the face of urgency and emergency situations, and a variable that may be influenced by negative feelings resulting from emergency situations.<sup>17</sup>

Instruments have been developed to measure the self-confidence of healthcare professionals and students in several clinical contexts.<sup>16,17</sup> However, there is no specific instrument that measures teachers' self-confidence in the face of health issues. In this respect, the development of a scale with the potential to measure teachers' self-confidence for the initial management of health issues in schools is justified, thus strengthening the planning of effective educational interventions among teachers. Therefore, the aim of the present study was to describe the construction and validation of a visual analogue scale of teachers' self-confidence with regard to the initial management of health issues in schools.

## METHOD

This is a methodological study, which enables the development of reliable instruments or research methods to be used

in new studies or clinical practice.<sup>18</sup> The instrument's development was based on Pasquali's assumptions.<sup>19</sup> According to the author, three procedures must be followed for the construction and validation of an instrument, namely: theoretical procedure, empirical procedure, and analytical procedure.

The theoretical procedure corresponds to the explanation of theoretical reasons that guided the construction of the instrument's items. In the present study, the items' construction was based on analysis of the national and international literature and discussions carried out among members of a research group from a public university of a city in the state of São Paulo directed to child health, with care and research experience in the area. The search in the literature aimed at deepening the understanding of the self-confidence construct, as well as recognizing the main health issues that occur in the school environment. Next, the first version of the scale with eight items was developed, and it was defined that the instrument would measure the self-confidence level of preschool and elementary school teachers to provide students with first aid.

The use of a visual analogue scale (VAS) was justified because of its easy and fast application, in addition to favoring the variability of responses and use of different statistical analyses.<sup>20</sup> Therefore, the VAS developed has a horizontal line of 10 centimeters with the following descriptors at the edges: "zero confident" to the left and "totally confident" to the right. In order to establish the score, respondents must indicate their confidence level along the line. The interpretation of the results is made based on the measurement of the space between the left end and the point indicated by the respondent, with the use of a centimeter ruler. The scale allows to measure the self-confidence level for each item, in addition to measuring the overall mean of self-confidence.

Based on the first version of the scale, the content validation process was initiated by twelve experts in the subject. The eligibility criteria for the choice of professionals were: experts in the pediatric nursing area or first aid, with academic or care experience for at least one year. It is worth mentioning that the experts were recruited by means of the snowball sampling technique, that is, the initially selected experts suggested potential participants.<sup>21</sup> The exclusion criterion was professionals who did not respond to the form for evaluation of the scale's items during the time determined.

Content validation considered the following four aspects: organization, clarity, comprehensiveness, and relevance of the items. The experts were told to analyze each item by means of a Likert scale with the following choices: I totally agree; I disagree; I do not know; I agree; and I totally agree. There was a space reserved for comments and suggestions. For analysis, suggestions were considered and the content validity index (CVI) per item in each aspect analyzed (organization, clarity, comprehensiveness, and relevance) and regarding the total scale were calculated.<sup>22</sup> For CVI analysis per item, the choices

"I agree" and "I totally agree" were added and divided by the total number of experts. The CVI mean of each item was used for CVI calculation of the total scale. A CVI equal to or higher than 0.80, both per item and total, was considered for content validation.<sup>22</sup>

The empirical procedure was then initiated with the purpose of evaluating the instrument's psychometric properties. This procedure consisted of semantic analysis stages and a pilot test. The eligibility criteria established for both stages were teachers who worked at public preschools and elementary schools of a city in the state of São Paulo, over 18 years of age, and with at least three months of professional experience. Exclusion criteria were: Teachers who were on vacation or leave at the time of the study. It is worth mentioning that, in spite of the same eligibility criteria, the participants in the semantic analysis and pilot test were not the same, totaling 25 and 36 teachers, respectively.

The semantic analysis sought to verify if all items of the scale were understandable. The teachers responded to the scale and evaluated each item with regard to clarity in writing, understanding of terms, and guidance on the filling in based on a Likert scale with the following possibilities of responses: I understood; It is clear; I had doubts; It is not clear and I did not understand; and it is confusing. There was space for suggestions.

The analytical procedure was carried out based on responses from the pilot test. Therefore, aiming at analysis and statistical validation of the scale's internal consistency, the responses of the 36 teachers were entered and stored in a Microsoft Excel® spreadsheet. Later, by means of the Statistical Analysis System for Windows 9.2 software, these data were

analyzed and correlated for determination of the Cronbach's alpha coefficient. Based on the assumption that the highest the correlations among the items, the greatest the homogeneity of the items and consistency in which the same dimension or theoretical construct are measured, an alpha equal to or higher than 0.70 was considered satisfactory.<sup>23</sup>

Due to the involvement of human subjects in the research, the present study followed the ethical aspects of Resolution 466/12 of the National Research Ethics Committee of the Brazilian National Health Council. The project was submitted to and approved by a research ethics committee under protocol no. CAEE 62949716.7.0000.5504 on February 24, 2017.

## RESULTS

After review of the national and international literature and discussions among members of the research group, the first version of the scale with eight items was developed. The items referred to teachers' confidence in evaluating and ensuring safety of the place where health issues occur, evaluating and recognizing the need for help, and evaluating and providing first aid in the following health issues: fever, choking, convulsive crisis, fall, deep injury and bleeding, and cardiac arrest.

Among the 12 experts who participated in the content validation process, 33.3% had a doctorate degree, with a mean professional experience of 9.5 years. The scale's total CVI was 0.86. However, the CVI for the clarity criterion was lower than the limit established in five items, as presented in Table 1.

**Table 1.** Content validity index (CVI) of the visual analogue scale of teachers' self-confidence for the management of health issues in schools per item and total. São Carlos, São Paulo, 2017

CVI – Item*	Organization	Clarity	Comprehensiveness	Relevance
1. I feel confident to evaluate and ensure safety of the place in the face of a clinical or traumatic issues in the school.	0.83	0.50	0.83	1.00
2. I feel confident to evaluate and recognize the need to call 192 for help.	0.92	0.75	0.83	1.00
3. I feel confident to evaluate and provide first aid to a child undergoing a convulsive crisis.	0.92	0.75	0.83	0.92
4. I feel confident to evaluate and provide first aid to a child who suffered a fall.	0.92	0.92	0.92	0.83
5. I feel confident to evaluate and provide first aid to a child who suffered a deep injury with bleeding.	0.92	0.67	0.83	0.92
6. I feel confident to evaluate and provide first aid to a child found unconscious and who is not breathing.	0.92	0.83	0.92	1.00
7. I feel confident to evaluate and provide first aid to a child who is choking.	0.83	0.83	0.83	0.92
8. I feel confident to evaluate and provide first aid to a febrile child.	0.92	0.67	0.92	1.00
Total CVI**			0.86	

\* Content validity index per item; \*\* Content validity index of the scale.

The following suggestions to improve items' clarity stood out: replacing the term "clinical or traumatic issue" for "health issues, whether due to an illness or accident"; replacing the term "deep injury" for "injury that is bleeding too much"; replacing the term "convulsive crisis" for "convulsion"; replacing the term "child found unconscious" for "unconscious child"; and adding the specification "call 192 for emergency medical services (SAMU, as per its acronym in Portuguese)". Another important suggestion refers to the dissociation of the items that analyze self-confidence of two different actions simultaneously, that is, teachers may have self-confidence to evaluate a specific situation; however, they may not feel self-confident to provide first aid in the same situation.

Based on the suggestions, a new version of the scale with 12 items was proposed, including the same themes previously described. This new version was submitted to a second content evaluation round by the same experts, resulting in total CVI of the scale and items equal to 1.00.

With the validation of the new version, 25 preschool and elementary school teachers were invited to participate in the

semantic analysis stage. They were all women with a mean professional experience of 16 years. With regard to the items' understanding, 22 (88%) teachers reported that all items of the scale were clear, three (12%) teachers reported lack of clarity in items 1 and 9; however, they did not present a writing suggestion. No item was considered "confusing". Therefore, the scale's items were considered understandable in general.

The pilot test was initiated after ensuring clarity of the items. Thirty-six preschool and elementary school teachers participated in this stage, being 94% women, with a mean age of 38.3 years and professional experience of 12.3 years. Regarding education level, most teachers had a specialization degree (38.9%). With regard to previous experience with health issues, 77.8% reported having already experienced them. Table 2 presents the mean scores of self-confidence per item among the teachers (n=36).

The Cronbach's alpha value of the self-confidence scale was 0.89, showing high internal consistency (>0.70) for the scale. Table 3 presents a correlation of the items and Cronbach's alpha value.

**Table 2.** Mean scores of self-confidence for the management of health issues in schools among preschool and elementary school teachers. São Carlos, São Paulo, 2017

Scale's items	Mean score	SD	Min.	Max.	Median
Item 1: I feel confident to evaluate safety of the place in the face of a child presenting a health issue, whether due to an illness or accident.	3.43	2.68	0.00	10.00	2.70
Item 2: I feel confident to identify the need to call 192 for emergency medical services (SAMU).	6.56	2.92	0.00	10.00	7.00
Item 3: I feel confident to recognize a child suffering a convulsion.	3.92	2.78	0.00	9.90	4.10
Item 4: I feel confident to provide first aid to a child who is suffering a convulsion.	2.09	2.64	0.00	10.00	0.65
Item 5: I feel confident to provide first aid to a child who suffered a fall.	4.11	2.82	0.00	10.00	3.85
Item 6: I feel confident to provide first aid to a child who suffered an injury that is bleeding too much.	3.95	3.04	0.00	10.00	3.35
Item 7: I feel confident to recognize an unconscious child who is not breathing.	3.20	2.95	0.00	10.00	2.35
Item 8: I feel confident to provide first aid to an unconscious child who is not breathing.	1.49	2.48	0.00	10.00	0.35
Item 9: I feel confident to recognize a child who is choking.	4.52	2.62	0.20	10.00	4.70
Item 10: I feel confident to provide first aid to a child who is choking.	3.21	2.73	0.00	10.00	3.35
Item 11: I feel confident to recognize a febrile child.	8.22	1.85	4.00	10.00	8.65
Item 12: I feel confident to provide first aid to a febrile child.	6.42	2.97	0.00	10.00	7.20

**Table 3.** Correlation and Cronbach's alpha value per item of the visual analogue scale of teachers' self-confidence for the management of health issues in schools. São Carlos, São Paulo, 2017

Scale's items	Correlation item/total	Cronbach's alpha if the item is removed
Item 1	0.627	0.884
Item 2	0.543	0.888
Item 3	0.625	0.884
Item 4	0.703	0.879
Item 5	0.595	0.885
Item 6	0.716	0.879
Item 7	0.711	0.879
Item 8	0.591	0.885
Item 9	0.651	0.882
Item 10	0.767	0.876
Item 11	0.332	0.899
Item 12	0.403	0.895

## DISCUSSION

The final version of the self-confidence scale was made up of 12 items, which refer to the main health issues occurred in the school environment, corroborating the literature. In this respect, fever stands out among the clinical issues included in the VAS - teachers' self-confidence for the management of health issues in schools. Fever is a common childhood event, responsible for 19% to 30% of the medical care provided in pediatric emergency units.<sup>24</sup> Fever, when not controlled, becomes a potential risk for complications, such as convulsions or brain damage.<sup>25,26</sup> In addition to febrile convulsions, epilepsy is another prevalent condition also presented in the scale.<sup>27</sup>

Regarding issues associated with accidents, the scale considers situations of fall, injuries with bleeding, and choking, which corroborate results found in other studies. One study that analyzed the profile of emergency care due to accidents and violence involving children under 10 years of age in Brazil showed that falls were frequent among the population studied.<sup>28</sup> In the same direction, one study carried in the USA confirms that foreign body airway obstruction/choking is a common pediatric emergency, being the sixth cause of accidental death among children.<sup>29</sup>

With regard to the use of analogue scales, several studies make use of them, especially for pain evaluation.<sup>30</sup> Visual analogue scales are more sensitive to minor differences and present greater agreement among experts.<sup>31</sup> One study that compared

visual analogue scales with Likert scales showed that VAS are less vulnerable to misunderstandings, in addition to presenting advantages with regard to response time, that is, they are faster to respond.<sup>20</sup>

In the content validation, the experts suggested alterations in some items in order to improve clarity and increase the scale's comprehensiveness. The inclusion of these suggestions enabled 100% of agreement, indicating appropriate understanding of the instrument. Galindo et al. also achieved agreement of all experts with regard to the content relevance of the booklet "First Aid at School" and its applicability.<sup>1</sup>

Despite not being the objective, teachers' low self-confidence levels for the management of health issues in schools corroborated the findings of one international study.<sup>14</sup> Therefore, further studies exploring the effect of educational interventions on first aid assistance must be carried out.

## CONCLUSIONS AND IMPLICATIONS FOR PRACTICE

The present study presented the construction and validation process of the visual analogue scale of teachers' self-confidence for the management of health issues in schools. The scale showed content validity in the experts' opinion (CVI of 86% in the first round and 100% in the second round), was considered understandable by the target audience, and presented high internal consistency among items. Therefore, the scale proved to be reliable to meet the dimension teachers' self-confidence with regard to the initial management of health issues in schools, in addition to being easily used and understood.

Nursing professionals, as well as those who work in the management of child education, may make use of this scale, since it may contribute to the planning and organization of systematized and effective educational strategies that promote greater confidence among teachers, and, consequently, a safe management of health issues in the school environment.

The reduced number of participants for initial analyses of internal consistency and the impossibility of accessing other measurement properties to strengthen the use of this instrument are presented as limitations of this study. Further studies on the validity and reliability of the instrument must be carried out.

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