

# Validation of an instrument to assess nurses' level of knowledge on the prevention and treatment of individuals with venous ulcers

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## Validating an instrument to assess nurse knowledge related to preventing and treating individuals with venous ulcer

**Objective.** Validating an instrument to assess nurse knowledge related to preventing and treating individuals with venous ulcer (VU) **Methods.** This is an exploratory study, conducted with 78 primary health care nurses. These professionals answered the questionnaire with twelve items pertaining to knowing and doing while addressing the person with VU. SPSS for Windows, version 21.0, with descriptive analyses and Pearson correlation was used for data analysis. **Results.** The measurement of questionnaire reliability, from Cronbach's alpha, revealed

in the Theoretical Knowledge Domain (TKD), 0.88 alpha, and in the Practical Knowledge Domain (PKD), 0.70 alpha, indicators that guaranteed reliability of such a measurement for the extracted sample. With regard to the correlation between TKD and PKD and Nursing Care to the Person with VU, those were significant and strong in almost all items. The bi-factorial model, with theoretical and practical domains, is what best explains the nurse assistance for the person with VU. The nurse that knows one or both domains in treating wounds, probably, will allow for greater dominance over VU and in assisting the person with VU. **Conclusion.** The validated version showed reliability, enabling thus the other professionals to tailor the same methodology to other topics, identifying

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the ramifications of knowing and doing and, thereby, strengthening gaps in the Nursing Education area.

**Key words:** education; nursing; leg ulcer; patient care; surveys and questionnaires; varicose ulcer.

### Validación de un instrumento para evaluar el nivel de conocimiento del enfermero respecto a la prevención y al tratamiento del individuo con úlcera venosa

**Objetivo.** Validar un instrumento para evaluar el nivel de conocimiento del enfermero respecto a la prevención y al tratamiento del individuo con úlcera venosa (UV).

**Métodos.** Estudio exploratorio de correlación, realizado con 78 enfermeros de atención primaria de la salud (APS). Estos profesionales respondieron una encuesta con doce ítems referentes al saber y al hacer en el abordaje a la persona con UV. En el análisis de los datos se utilizaron SPSS para Windows, versión 21.0, con análisis descriptivos y de correlación de Pearson.

**Resultados.** La medida de confiabilidad de la encuesta, a partir del alfa de Cronbach, señaló en el Dominio de Conocimiento Teórico (DCT) alfa de 0.88 y en el Dominio de Conocimiento Práctico (DCP), alfa de 0.70, indicadores que garantizaron la fiabilidad de tal medida para la muestra recolectada. Con respecto a las correlaciones entre el DCT y el DCP y a la Asistencia de Enfermería a la Persona con UV, estas resultaron significativas y sólidas en casi todos los ítems evaluados. El modelo bifactorial, con dominios teórico y práctico, es el que mejor explica la asistencia del enfermero a la persona con UV, pues como él conoce uno o ambos dominios en el tratamiento de heridas, probablemente, tendrá un mayor dominio sobre la UV y en la atención a la persona con UV.

**Conclusión.** La versión validada demostró confiabilidad, lo que posibilita que otros profesionales puedan adecuar la misma metodología en otras temáticas, identificando las ramificaciones del saber y del hacer. De este modo se fortalecen y se mejoran las falencias existentes en el área de Educación en Enfermería.

## Introduction

Chronic venous insufficiency is an advanced stage of venous disease arising from abnormalities of the venous system that causes swelling, skin changes and/or venous ulcers, which are lesions affecting the lower limbs below the knee and stems from the difficulty of venous return.<sup>1</sup> The

**Palabras clave:** educación; enfermería; úlcera de la pierna; atención al paciente; encuestas y cuestionarios; úlcera varicose.

### Validação de um instrumento para avaliar o nível de conhecimento do enfermeiro relacionado com a prevenção e o tratamento do indivíduo com úlcera venosa

**Objetivo.** Validar um instrumento para avaliar o nível de conhecimento do enfermeiro relacionado à prevenção e ao tratamento do indivíduo com úlcera venosa (UV).

**Métodos.** Trata-se de estudo exploratório correlacional, realizado com 78 enfermeiros da atenção primária à saúde. Estes profissionais responderam a questionário com doze itens referentes ao saber e ao fazer na abordagem à pessoa com UV. Na análise dos dados, utilizaram-se SPSS para Windows, versão 21.0, com análises descritivas e de correlação de Pearson.

**Resultados.** A medida de confiabilidade do questionário, a partir do alfa de Cronbach, revelou no Domínio de Conhecimento Teórico (DCT) alfa de 0.88 e no Domínio de Conhecimento Prático (DCP), alfa de 0.70, indicadores que garantiram a fidedignidade de tal medida para a amostra coletada. No que se refere às correlações entre o DCT e o DCP e à Assistência de Enfermagem à Pessoa com UV, estas foram significativas e fortes em quase todos os itens avaliados. O modelo bifatorial, com domínios teórico e prático, é o que mais bem explica a assistência do enfermeiro à pessoa com UV. O enfermeiro que conhece um ou ambos os domínios no tratamento de feridas, provavelmente, possibilitará maior domínio sobre UV e na assistência à pessoa com UV.

**Conclusão.** A versão validada mostrou confiabilidade, o que possibilita que outros profissionais possam adequar a mesma metodologia para outras temáticas, identificando as ramificações do saber e do fazer e, desse modo, fortalecer lacunas na área de Educação em Enfermagem.

**Palavras chave:** educação; enfermagem; úlcera de perna; assistência ao paciente; inquéritos e questionários; úlcera varicosa.

clinical severity of chronic venous insufficiency occurs due to chronic stasis and congestion related to a number of factors, including varicose veins, history of deep vein thrombosis, obesity, smoking, reflux in the deep veins, impairment of the calf muscle pump, family history, or a combination of these factors that generate a persistent venous hypertension, which causes

swelling, inflammation and tissue fibrosis, causing skin ulcers.<sup>2</sup> It is estimated that 75% of leg ulcers are venous ulcers,<sup>3</sup> and varicose veins without skin changes have prevalence of approximately 20% in the North and West of Europe, whereas advanced chronic venous insufficiency affects about 3% of the population on this continent.<sup>2</sup> In Brazil, the number of individuals affected by venous ulcer is obtained only from few research,<sup>4,5</sup> because there are no laws that obligate the notification of this problem in the Unified Health System (SUS).

Generally speaking, venous ulcer compromises the quality of life of the individual, interferes with productivity and causes social isolation. Therefore, nurses who provide care for people with venous ulcers need to have specific knowledge. One of the methodological ways that can base the implementation of this care is the standards of knowledge proposed by Barbara Carper. In the 1970s, she proposed four types of standards of knowledge, namely: empirical, aesthetic, ethical and personal, that are embedded in theories that guide the nursing care.<sup>6</sup> Skills were selected for a theoretical domain of knowledge – the knowing – and a practical domain of knowledge – the doing – which enabled preparing a scale whose objective is to verify, in the view of nurses responsible for people with venous ulcers, the existence of theoretical and practical dimensions. In nursing field, domain can be understood as the scope of one's area, i.e., the extent of one's knowledge, which is a personal domain, the understanding of knowledge by a person, in this case, by the nurse, who during their training develops the knowledge (explicit knowledge), and in their daily practice, the know-how (practical knowledge).<sup>7</sup> Hypothetically, both are interdependent and are part of a broader set of nursing field, including ethical and personal components perceived during the implementation of care.<sup>8</sup> Due to the complexity and scope of components that underlie the nursing field and the deepening required to analyze them, authors chose to build and validate an instrument to assess nurses' level of knowledge on the prevention and treatment of individual patients with venous ulcers.

## Methods

This is a correlational descriptive study with a quantitative approach, performed in an institution designed to enable and enhance the health worker, located in Joao Pessoa, Paraiba, Brazil. Study participants were 78 nurses, from a population of 180, who worked in the Family Health Units of the municipality. The inclusion criteria adopted for this selection was that there must be individuals with venous ulcers in the area covered by the health unit. The exclusion criterion was the non-availability of time to participate in the investigation on the scheduled date. Thus, each nurse was selected by the manager of their respective Sanitary District, who adopted this criterion for inclusion.

For data collection, conducted between May and June 2014, researchers used a self-assessment instrument, whose objective was to assess the knowledge of nurses in terms of knowing and doing the management of individuals with venous ulcers, which had as reference the observations and evaluations carried out by the researcher herself, based on the literature approaches on the theme, as well as on her experience in care for people with chronic venous insufficiency. In addition, the instrument was subjected to a pre-test by four expert nurses in the field in order to review and direct the data collection process.<sup>9</sup> Subjects answered a questionnaire with the following items: a) two questions on the wounds theme: How do you evaluate your domain on wound care? How do you evaluate your domain on venous ulcer? In both questions the answer followed a Likert scale ranging from 1 = none, 2 = little, 3 = moderate, 4 = good and 5 = excellent; b) ten questions related to nursing care to the person with venous ulcers. The items were organized in domains relating to knowledge and practice of nurses. With regard to *knowledge*, the questions were: How do you evaluate your domain regarding anamnesis and physical examination of the person? How do you evaluate your domain as for the assessment of the ulcer? How do you evaluate your domain in choosing the coverage? How do you evaluate your domain regarding the

evaluation of the need for exchange coverage? How do you evaluate your domain in the evaluation of the lower limbs to investigate the arterial impairment? How do you evaluate your domain in the evaluation of the lower limbs to investigate venous impairment? As concerns to practice, the questions were: How do you evaluate your domain as cleaning the injury? How do you evaluate your domain in the implementation of conservative instrumental debridement (with scissors or scalpel blade)? How do you evaluate your domain as the collection of culture in Levine technique (only with Swab)? How do you evaluate your domain in the application of elastic compression therapy? Answer items also varied according to the Likert scale, previously presented.

The research project was submitted to the Research Ethics Committee of the Health Sciences Center and accepted under protocol number 0708/13. The instrument was applied after reading and signing of the Informed Consent Term. The researcher gave each participant the questionnaire and stayed with them while they answered it, to clarify any doubts. This activity lasted on average 20 minutes. For analysis of the data, the researcher used the 21.0 version of SPSS for Windows. In addition to the descriptive and Pearson correlation analysis, authors proceeded to the calculation of Cronbach's alpha and the calculation of structural equations, and the latter were made in the AMOS GRAFICS 21.0. To calculate the structural equation, the following statistical indicators for the Structural Equations Model (SEM) were considered, according to a subjective goodness-of-fit, in order to suit the possible measurement errors between the variables:  $\chi^2$  (Chi-square); *Root Mean Square Residual* (RMR); *Goodness-of-Fit Index* (GFI) and *Adjusted Goodness-of-Fit Index* (AGFI); *Root-Mean-Square Error of Approximation* (RMSEA); *Comparative Fit Index* (CFI); and *Tucker-Lewis Index* (TLI).

The  $\chi^2$  has been little used in the literature. It is more common to consider its ratio in relation to the degrees of freedom ( $\chi^2/g.l.$ ). In this case, values up to 5 indicate a suitable adjustment. For the model to be considered well-adjusted according

to the RMR, the value must be less than 0.05. The GFI and the AGFI are analogous to the  $R^2$  in multiple regression and range from 0 to 1, and values between 0.80 and 0.90 or higher indicate a satisfactory adjustment.<sup>10,11</sup> As for the RMSEA, it should be between 0.05 and 0.08. Values up to 0.10 can be accepted.<sup>12,13</sup> The CFI considers values closer to one as satisfactory adjustment indicators.<sup>10,14</sup> As for the TLI, the variation can be from zero to one, with an acceptable index above 0.90. Thus, following these scanning parameters, the proposed theoretical model is that the most general knowledge about the treatment of wounds is associated with the domain of venous ulcer knowledge. In this sense, it was decided to investigate the relationship of the contents of attitudinal construct scale items, in order to evaluate the relationship between theory and professional practice of the measuring instrument developed, with the situations specified in the items and how it represents the expected aspects.<sup>15,16</sup> Then, there was convergent analysis to assess the relationship of the Wound Treatment Domain (WTD) with more specific areas.

## Results

Among the participants, the female (95%) were majority, with age ranging from 26 to 69 years (mean = 42.5 years, SD = 10.1) and average of 12.7 years of professional experience in primary health care. Through the collection and organization of data, the questionnaire reliability measure was set from Cronbach's alpha ( $\alpha$ ), which revealed indicators that ensured the reliability of such a measure for the collected sample, namely: for Theoretical Knowledge Domain (TKD), the alpha was 0.88 and the variation remained between 0.83 and 0.89 when an item was excluded; for Practical Knowledge Domain (DCP), the alpha was 0.70, which showed a variation, when the item was deleted, from 0.67 to 0.74. Considering the observed alphas, it can be said that the instrument developed to evaluate the nurse's attitude towards people with venous ulcers is reliable, because the alpha scores were above 0.70.<sup>16</sup> However, it is worth noting the existence of an alpha that, when deleted an item

in the PKD, was below 0.70. Such a condition cannot be regarded as a measurement problem since the alpha indicator has an influence on its variation from the 'n' sampling and the number of

items belonging to the instrument. Table 1 shows all Pearson correlations (r) of the items for the TKD factor and for the Nursing Care to the Person with Venous Ulcer (NCPVU).

**Table 1.** Correlational scores for evaluation of Theoretical Knowledge Domain (TKD) and Nursing Care to the Person with Venous Ulcer (NCPVU). Joao Pessoa, PB, Brazil, 2014

Itens (conteúdo)	TKD	NCPVU
Anamnesis and physical examination	0.64*	0.59*
Ulcer Assessment	0.85*	0.82*
Assessing the need to choose the coverage	0.86*	0.82*
Assessing the need to exchange the coverage	0.76*	0.74*
Evaluation of the lower limbs for arterial impairment	0.79*	0.72*
Evaluation of the lower limbs for venous impairment	0.82*	0.77*

\* p < 0.05 by Pearson correlation analysis

It is noteworthy that all correlations relating to items for the factor TKD and NCPVU - (considering the total score of the scale), were significantly positive, strong in five of the six evaluated items and moderate in only one

item for both the TKD and for the NCPVU. A similar calculation was performed to assess the relationship of the second dimension, referring to the PKD in assisting the people with venous ulcers, as shown in Table 2.

**Table 2.** Correlational scores for evaluation of the Practical Knowledge Domain (PKD) and Nursing Care to the Person with Venous Ulcer (NCPVU). Joao Pessoa, PB, Brazil, 2014

Items (content)	PKD	NCPVU
Injury cleaning	0.58*	0.70*
Implementation of conservative instrumental debridement	0.84*	0.60*
Culture collection in Levine technique	0.83*	0.62*
Application of elastic compression therapy	0.64*	0.56*

\* p < 0.05 by Pearson correlation analysis

From the Pearson correlation (r), it was observed that the items relating to the nurse's PKD and to the NCPVU showed positive correlations with the specific factor and the total score of the scale, with all significant values (Table 2). Whereas the developed scale proved reliable from the psychometric indicators above highlighted, for the said sample, authors decided to evaluate the relationship between the domains and the total

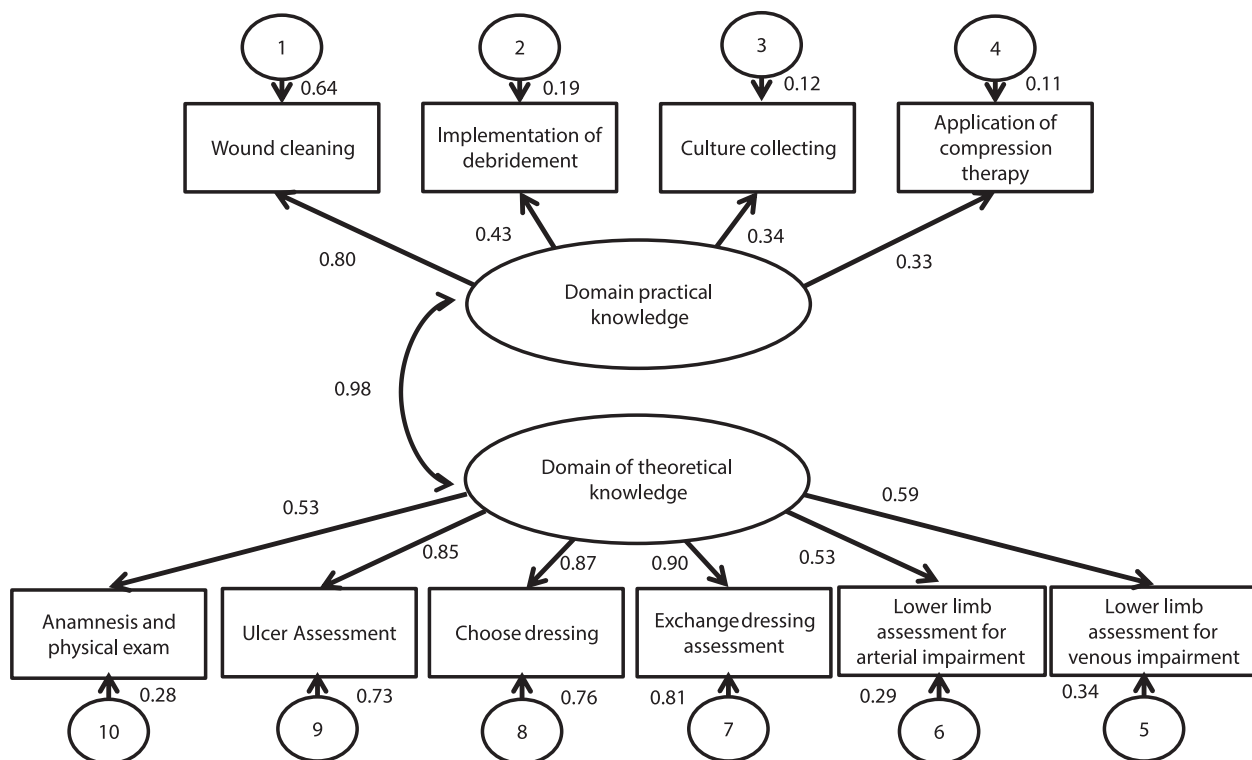
score of the scale (i.e., Nursing Care to the Person with Venous Ulcer - NCPVU). To inform about the importance of these domains in nursing care, researchers conducted a convergent analysis in order to evaluate the relationship of knowledge about the treatment of wounds in general and the specificity of the domains. In this sense, respondents were expected to give answers that show they had knowledge and practice in the

broader area of the topic and probably would have positive correlations with the domains in NCPVU, which concluded that the variable Wound Treatment Domain (WTD) correlated significantly with the variable of a more general approach to venous ulcer ( $r = 0.76$ ;  $p < 0.001$ ) and with the specific domains of NCPVU, the TKD ( $r = 0.68$   $p < 0.001$ ) and the PKD ( $r = 0.54$ ;  $p < 0.001$ ). In similar vein, there was relationship between the variable of the more general approach of venous ulcers with the PKD and the TKD, which were significantly positive and with the respective scores ( $r = 0.51$  and  $r = 0.72$ ;  $p < 0.001$ ). For this, authors carried out a confirmatory factor analysis (CFA) hypothesizing the multifactorial model found theoretically and comparing it to a one-factor model (in which all scale items have saturation in a single factor). Thus, it was decided to leave the covariances ( $\phi$ ,  $\phi$ ) free between the

factors, a condition in which fit quality indicators have shown similar to the recommendations presented in the literature.<sup>17,18</sup>

According to the results obtained in these analysis, the present study showed that the two-factor model had the best results, which revealed the following fit quality indicators:  $\chi^2/df = 1.52$ ,  $RMR = 0.05$ ,  $GFI = 0.91$ ,  $AGFI = 0.80$ ,  $CFI = 0.98$ ,  $TLI = 0.95$ ,  $RMSEA (90\%CI) = 0.08 (0.01-0.13)$ ,  $CAIC = 198.72$  and  $ECVI = 1.27$ . In order to qualify the desired model, the one-factor model was verified, which revealed the following indicators:  $\chi^2/df = 7.75$ ,  $RMR = 0.12$ ,  $GFI = 0.66$ ,  $AGFI = 0.47$ ,  $CFI = 0.57$ ,  $TLI = 0.45$ ,  $RMSEA (90\%CI) = 0.30 (0.26-0.33)$ ,  $CAIC = 378.28$  and  $ECVI = 4.04$ .

Figure 1 shows the resulting factor structure (standard solution) of this analysis.



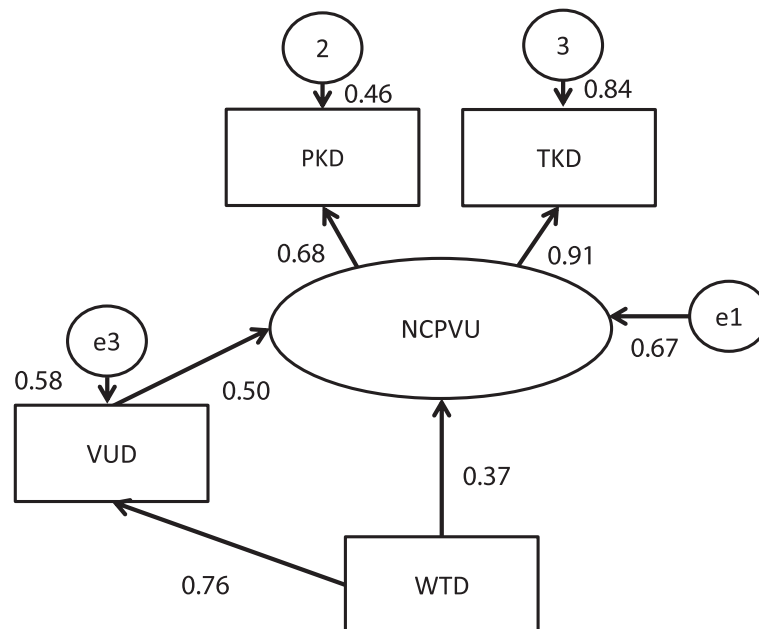
**Figure 1.** Factorial structure of the scale of Knowledge Domains on Nursing Care to the Person with Venous Ulcer.

As shown, all the saturations (Lambdas,  $\lambda$ ) are within the expected range | 0-1 |, which denotes no estimation problems. Moreover, all are statistically different from zero ( $T > 1.96$ ,  $p < 0.05$ ), and this corroborates the existence of two factors (or dimensions) of NCPVU scale. The study showed that the lambdas correlations ( $\lambda$ ) showed good associative force between them, especially between TKD and PKD factors ( $\phi = 0.98$ ). It is worth noting that the prediction estimates from the regression analysis for this model identified the significant variables ( $p < 0.001$ ) and also revealed a criterion ratio within what is statistically required (ranging from 03.25 to 10.60). The factor structure of this scale, in this theoretical and empirical context, evidences how much the nurse represents regarding the domain of knowing and doing the care for people with venous ulcers. In this construct, the items-factor correlations of each dimension correlations are evaluated based on the following dimensions: PKD and TKD.

Overall, goodness-of-fit indicators showed evidence of the factor validity and robustness in relation to the structural model, theoretically proposed. These indicators are suggested by the literature for this calculation as empirical guarantee (for example,  $\chi^2/df$ , GFI, AGFI, RMR, TLI, CFI, RMSEA, CAIC and ECVI).<sup>10,11</sup> After recognizing this scale factor organization, researchers intended to verify a theoretical model in which it was hypothesized the correlation of general knowledge about the WTD to more specific knowledge about the respondent's domain in the area of venous ulcers, with them influencing the construct of TKD and PKD. Thus, from the structural equation analysis and modeling, authors performed the empirical and theoretical verification of the alleged model in Amos Graphics 21.0 program. For this purpose,

it was considered a recursive model of structural equation.

In Figure 2, after carrying out appropriate modifications in error adjustments, researchers found a suitable model, which had reason  $\chi^2/df = 1.88$ , RMR = 0.03, GFI = 0.99; AGFI = 0.94, CFI = 0.99, TLI = 0.99 and RMSEA (90%CI) = 0.02 (0.01-0.19). Figure 2 shows that the score of WTD variable had positive association ( $\lambda = 0.76$ ) with the more specific variable on the Venous Ulcer Domain (VUD = 0.76) and with the construct NCPVU ( $\lambda = 0.37$ ), and the latter includes the practical and theoretical areas. It was also verified the correlation between VUD and NCPVU ( $\lambda = 0.37$ ). It can be seen that the lambda correlations ( $\lambda$ ) between the variables show good associative force between them (ranging from 0.37 to 0.75). With these results, one can observe not only the hypothetical guarantee of the proposed model, but also the importance of the correlation between the presented variables, since in the hypothesized theoretical model, the statistical indicators ensured the theoretical and empirical conceptions in the development and direction of the model. It is highlighted that, even if the subject has a WTD, this influences the VUD, which explains the NCPVU, despite, also, that the WTD influences the NCPVU in smaller proportions. In the model, shown in Figure 2, there is highlight to the Lambda ( $\lambda$ ) of VUD and WTD, in that the former is much greater in the explanation for the NCPVU construct. With regard to the predictive estimate of the relationship between variables in the model shown above (see Figure 2), results are confirmed when observing the estimates that were significant with a  $p < 0.001$  and criterion ratio within which is statistically required (range from 2.77 to 10:32).



**Figure 2.** Graphic representation of the theoretical model of the knowledge of the domain of NCPVU.

**Notes:** NCPVU = Nursing Care to the Person with Venous Ulcer; PKD = Practical Knowledge Domain; TKD = Theoretical Knowledge Domain; VUD = Venous Ulcers Domain; WTD = Wound Treatment Domain.

## Discussion

As shown in the results, the two-factor model is the one that best explains the NCPVU, understood from the organization of the domains, i.e., theory and practice. However, it is clear that, in this model, the presence of less strong correlations, with regard to TKD and to the performance of debridement (00:43), the collection of culture (12:34) and the application of compression therapy (0:33). These data may indicate that these nurses do not experience these activities in primary health care, as confirmed by research in other contexts.<sup>19,20</sup> The two-factor model supports the idea that scientific knowledge in health helps to describe, explain, predict and prescribe phenomena of interest for the practice, thus providing the professional basis so that one can make decisions from the practical judgment, while practice underlies the theory. However, despite the apparent simplicity of this model, as explained an expert on the theme,<sup>21</sup> nursing care is a complex action in which the knowing

and doing compose an inseparable and integral dialogic so that the professional in this area can understand and work in different clinical situations.

In view of this complexity, this knowledge that guides nursing care emerges. The knowing-doing means going beyond what is prescribed and is a competent action, whereas the know-how means the ability. Based on this understanding, the aforementioned knowledge refers to a broad knowledge that involves, in addition to the rescue of scientific knowledge, the experience in clinical reasoning of nurses in favor of a genuine care, in which the individual needs of every being are taken into account.<sup>22</sup> Furthermore, when caring for a person, the nurse gains experience and improves the know-how and knowing-doing. In care to people with venous ulcers, the psychomotor learning is developed by cleaning with saline spray at 0.9%, in the handling of a scalpel blade to make the conservative instrumental debridement, in the collection of culture by Levine technique and in



the correct application of a compression therapy which overlaps without making a tourniquet in the member.

The cognitive learning develops when the professional treats a person with a different injury so that they can make inferences with what has been learned, as in the arterial ulcer, in which there are significant differences compared to venous ulcer. In addition, this learning is consolidated in every physical examination, medical history, assessment of injury, choice of the right coverage and the need to replace it without causing risk to the patient. Regarding the influence of WTD on other more specific domains, Figure 2 shows that in knowledge to a broader care, the WTD influences the VUD and, in turn, in practical and theoretical domains for care to people with this type of injury.

Given the above, it is concluded that a broader learning aids in the VUD construct, consolidated through the PKD and TKD, which influence each other concomitantly, and that knowledge, in which the broader knowledge is the basis for a more specific understanding, is developed hierarchically and refers to reconciliation between significant similarities and differences, important elements of safe care. Thus, knowledge of all these domains helps the nurse to provide a resolute care, targeted to the needs of each person, and that the main element involved in this cohesive assistance is the clinical reasoning of nurses, a systematic and dynamic process that involves mental functions and guides the decision-making in the care for the individual. This process requires a cognitive ability, clinical knowledge, experience and intuition to integrate the whole situation.<sup>23</sup>

Education is among the activities that can develop clinical reasoning with these professionals, including teaching approaches that foster creativity, discoveries and questions, including small group activities and simulations,<sup>24</sup> besides the experience itself. In these exercises, practice consolidates theoretical knowledge, because the doing leads to the understanding of the complexity

and uniqueness of knowledge on care, which leads the nurse to think about their own actions and to incorporate new knowledge, re (create) their way to provide care and to become a researcher in the very practical context. This private knowledge is recreated in every meeting, every moment of care, and becomes richer and richer in practical-reflexive rationality, in every moment of interaction, continuously, leading to new interpretations and adding, in every solution found, specific knowledge of nursing. This is why it is different and unique for each person who experiences it. In contrast, public knowledge comes from scientific evidence that are published and documented and is the result of created knowledge, accumulated and perfected in practice.<sup>21</sup>

It is noteworthy that the approach to the individual with venous ulcers, as a true and scientific knowledge, should refer to a reflection for action, which involves from the action of a simple dressing to the reflection of evaluation of the person and the choice of an appropriate course of action. Therefore, further research are necessary, in loco, in order to evaluate the other standards of knowledge besides those presented in the present study, specifically covering the proposed standards set by Carper, as, according to this author, there are the aesthetic standards and the ethical standards of knowledge, which can be investigated through observational studies, during care practice. The knowing and the doing are unbuilt and (re) built in care relations and are joined for a of specific knowledge body of nursing. Thus, despite the apparent two different sets of knowledge, the existing dialectic between knowing and doing refers to a single action - the care of the human being, which involves all its complexity of science and action.

At the conclusion of this research, it was possible to verify empirically both a measure of knowing and doing in nursing care to people with venous ulcers and stating that a more general knowledge about wound treatment is associated with the venous ulcer knowledge domain and which is associated with the domain of nursing care to the person with ulcer in their practical and theoretical

dimension. Thus, these results confirmed the hypothesis presented in this study regarding the measure of the constructs on NCPVU, which revealed a positive association between the two evaluative dimensions, the PKD and TKD. This condition was observed by a classical statistical analysis (TCT) and a more complex (CFA) when analyzing their statistical scores. More importantly, it corroborated the existence of a theoretical model that assumed a knowledge (PKD) and a previous doing (TKD) as influential variable for nursing care to people with venous ulcers (NCPVU), that is, theoretically, focusing on a larger and better continuing education in the theoretical and practical domains of ulcers and wounds would contribute for the quality of care for people with VU.

Thus, these results contribute to explain how to manage and apply the theoretical and practical knowledge in care for injured people, based on health education and management. The results also contribute to offer, establishing the findings of this study as analytical direction, guarantees in the theoretical and empirical organization able to assess the knowledge and the performance of nurses towards the person with venous ulcers. The proposed measure would be useful for a diagnosis in terms of structure and functionality of knowledge and their adjustment in health field and in the care to people with venous ulcers. In general, with regard to the relationship between the variables, it can be said that the proper knowledge on a WTD will probably allow a larger VUD and better knowledge and administration in NCPVU. Thus, it is expected that other professionals can adequate the same methodology to other issues, in order to identify the ramifications of knowing and doing in nursing, and thereby fill gaps in Nursing Education. Although these results are consistent, confirming the hypothesis in question, it is necessary to point out some limitations: 1 - this study did not compare the answers between nurses from different (public and private) nursing settings; 2 - another limitation refers to non-evaluation of the hypothesis considering the time of service and academic training in order to evaluate the variation of answers by controlling such variables;

3 - another limitation of the study was the lack of control of psychological variables (for example, empathy, pro-social behavior, satisfaction with life, expectation of future, etc.), able to evaluate the intensity and frequency of nurses' answers regarding the person with venous ulcers, since it is a disease with physical injury, but also of social aesthetics, thus requiring a greater sensitivity on the part of the caregiver.

## References

1. Eklof B, Perrin M, Delis Kt, Rutherford Rb, Glociczki P. Updated terminology of chronic venous disorders: The VEIN-TERM transatlantic interdisciplinary consensus document. *J. Vasc. Surg.* 2009; 49(2):498-501.
2. Fiebig A, Krusche P, Wolf A, Krawczak M, Timm B, Nikolaus S, Frings N, Schreiber S. Heritability of chronic venous disease. *Hum. Genet.* 2010; 127(6):669-74.
3. Scottish Intercollegiate Guidelines Network (SING). Management of chronic venous leg ulcers: a national clinical guideline. Edinburgh: SING; 2010.
4. Abbade LPF, Lastória S, Rollo HA. Venous ulcer: Clinical characteristics and risk factors. *Int. J. Dermatol.* 2011; 50(4):405-11.
5. Malaquias SG, Bachion MM, Sant'Ana SMSC, Dallarmi CCB, Lino Junior RS, Ferreira PS. People with vascular ulcers in outpatient nursing care: a study of sociodemographic and clinical variables. *Rev. Esc. Enferm. USP.* 2012; 46(2):302-10.
6. Carper B. Fundamental patterns of knowing in nursing. *Advances in Nursing Science.* 1978; 1(1):13-24.
7. Salomé GM, Espósito VHC. Vivências de acadêmicos de enfermagem durante o cuidado prestado às pessoas com feridas. *Rev. Bra Enferm.* 2008; 61 (6): 822-27.
8. Cestari ME. Padrões de conhecimento da enfermagem e suas implicações no ensino. *Rev. Gaúcha Enferm.* 2003; 24(1):34-42.
9. Richardson RJ, Peres JAS, Wanderley JCV, Correia LM, Peres MHM. Pesquisa social: métodos e técnicas. 3. Ed. São Paulo: Atlas; 2012.

10. Hair JF, Tatham RL, Anderson RE, Black W. *Análise Multivariada de Dados*. Porto Alegre: Bookman; 2005.
11. Lattin L, Carrol JD, Green PE. *Análise de dados multivariados*. São Paulo: Cengage Learning; 2011.
12. Garson GD. PA 765 Statnotes: An online textbook [Internet] 2003 [Cited 2015 Jan 20]. Available from: <http://www2.chass.ncsu.edu/garson/pa765/statnote.htm>
13. Kelloway EK. *Using LisREL for structural equation modeling: A researcher's guide*. Thousand Oaks, CA: Sage Publications; 1998
14. Joreskög K, Sörbom D. *LISREL 7 user's reference guide*. Mooresville: Scientific Software; 1993.
15. Cunha, SE. *A noção de validade de testes psicológicos*. Rio de Janeiro. CEPA;1994.
16. Pasquali L. *Psicometria: teoria dos testes na psicologia e na educação*. Petrópolis: Vozes; 2011.
17. Byrne BM. *A primer of LISREL: Basic applications and programming for confirmatory factor analytic models*. New York: Springer-Verlag; 1994.
18. Van de Vijver F, Leung K. *Methods and data analysis for cross-cultural research*. Thousand Oaks, CA: Sage Publications; 1997.
19. Santos ICRV, Souza MAO, Andrade LNV, Lopes MP, Silva MFAB, Santiago RT. Caracterização do atendimento de pacientes com feridas na Atenção Primária. *Rev. Rene*. 2014; 15(4):613-620.
20. Peres GA, Zuffi FB; Poggetto MTD. Prática dos enfermeiros nos cuidados às pessoas com úlcera venosa na saúde da família. *Saúde Coletiva*. 2013; 10(59): 37-41.
21. Queirós PJP. Reflexões para uma epistemologia da enfermagem. *Texto Contexto Enferm*. 2014; 23(3):776-81.
22. Vale EG, Pagliuca LMF, Quirino RHR. Saberes e práxis em enfermagem. *Esc. Anna Nery Rev. Enferm*. 2009; 13(1):174-180.
23. Correa CG, Cruz DM, Ângelo M. Raciocínio Diagnóstico de Enfermeiros Especialistas em Cardiologia. *Rev. Soc. Cardiol. Estado de São Paulo*. 2011; 21(2 sup. A):16-21.
24. Cerullo JASB, Cruz DALM. Raciocínio clínico e pensamento crítico. *Rev. Latino-Am. Enfermagem*. 2010; 18(1):124-9.