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ORIGINAL ARTICLE

CONSTRUCTION AND VALIDATION OF A SCALE OF SELF-EFFICACY IN PREGNANT WOMEN FOR THE PREVENTION OF HYPERTENSIVE SYNDROMES IN PREGNANCY

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ABSTRACT

Objective: to construct and validate the Scale of Self-efficacy in Pregnant Women for the Prevention of Complications resulting from Hypertensive Syndromes in Pregnancy. Method: a methodological study with a quantitative approach, developed between April 2018 and May 2019 in a public university from the Brazilian South region. The theoretical, experimental and analytical procedures were performed. Content validation was conducted in two stages with evaluators, and semantic validation was performed with pregnant women. The statistical tests used were that of the Content Validity Index and Cronbach's alpha. Results: the scale consists in 17 items distributed into seven domains: Drug treatment, Prenatal care, Intervention based on common sense, Understanding of the recommendations with support from the family, Lifestyle, Dietary intervention, and Self-care. The domains' internal consistency assessed by means of Cronbach's alpha varied from 0.527 to 0.597. Conclusion: the scale presented acceptable psychometric properties and can improve the systematization of the care provided to pregnant women with a hypertension diagnosis.

DESCRIPTORS: Self-efficacy; Psychometry; Pregnant women; Hypertension; Validation studies.

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INTRODUCTION

Women's health is highlighted in the general guidelines of the municipal, state and federal spheres, which seek to reduce health problems, in order to cover health promotion and protection, disease prevention, diagnosis and treatment[1].

Hypertensive Syndromes in Pregnancy (HSP) are considered one of the most common complications of the puerperal-pregnancy cycle, with pre-eclampsia and eclampsia being those with the greatest complications, as they are directly linked to care[2]. Mortality due to elevated blood pressure levels during pregnancy is the main cause of maternal mortality in Brazil and requires investigation and monitoring during prenatal care, aiming at early diagnosis and treatment, in addition to reducing the negative effects on the health of the woman and the child[3].

The need to identify HSP allows for the promotion of adequate assistance and anticipation of satisfactory results. Approximately 15% of the pregnancies are characterized as high risk and, according to governmental guidelines, when high gestational risk is identified, there is indication for rigorous treatment and monitoring, focused on clinical, obstetric, socioeconomic and emotional aspects, with the objective of achieving a healthy pregnancy and delivery[2].

In view of the complexity of this syndrome, the use and construction of instruments and scales is an alternative to facilitate care, making it individualized, as well as guiding health professionals in the implementation of strategies to change behaviors.

From this perspective, the application of scales that measure self-efficacy in prenatal care is recommended, since this strategy promotes skills development and encourages people to face the most diverse situations[4]. Thus, when measuring self-efficacy, it is possible to involve the pregnant woman in the participation and planning of her own care, encouraging the maintenance of care with assessments of short-, medium- and long-term goals.

The existence of a valid and reliable instrument is of great importance so that health professionals can promote the health care of pregnant women and, thus, exert a positive impact on the maternal and perinatal morbidity and mortality indicators. To assess greater trustworthiness of a developed scale, this study aimed at constructing and validating the Scale of Self-efficacy in Pregnant Women for the Prevention of Complications resulting from Hypertensive Syndromes in Pregnancy.

METHOD

A methodological study with a quantitative approach for the construction and validation of the Scale of Self-efficacy in Pregnant Women for the Prevention of Complications resulting from Hypertensive Syndromes in Pregnancy (*Escala de Autoeficácia de Gestantes na Prevenção de Complicações das Síndromes Hipertensivas da Gravidez*, EASHG), grounded on the Psychometry models, consisting in theoretical, experimental and analytical procedures[5].

During the theoretical procedures, it was necessary to deepen on the construct; and, to operationalize the elaboration of the items and domains, an integrative review[6] was conducted to search and synthesize the evidence on the theme and perform the first procedure to construct the scale. Three categories were evidenced during the review, namely; drug treatment, lifestyle, and prenatal care, which gave rise to the domains and to

the elaboration of the items.

After elaborating the items and domains, the content validation stages were carried out with the support of evaluators. For this analysis, seven judges were selected, experts in the field of the construct, as the task is to determine whether the items refer to the trait in question[5].

At this stage, the inclusion criterion was as follows: being a professor and/or preceptor of the Specialization Course in Obstetric Nursing at Rede Cegonha – CEEO/UFPR. Those who were on medical leave and/or vacation during the research period were excluded.

The evaluators conducted content validation in two rounds. The first was held in an individualized manner, by means of printed material handed in to the evaluators, in April and May 2018 The second was held in July 2018, in person and at the premises of a public higher education institution in southern Brazil, through a consensus workshop. It started with a brief explanation about the theoretical elaboration of the construct, its respective domains and the validation process. The consensus workshop was held with the judges by discussing the answers and suggestions from this and the previous round and the statistical analysis of each item.

The Content Validity Index (CVI) was used to assess the instrument's agreement, considering a rate equal to or greater than 80%[5]. The Statistical Package for the Social Sciences (SPSS®) software, version 20.0, was used for the analysis.

In September 2018, it was possible to conduct the semantic validation stage, whose objective was to verify that all the items are understandable for the instrument's target population[5]. The most efficient way to conduct semantic analysis is to apply the instrument to a sample of 30 subjects, in order to test their understanding in relation to the items[5].

Thus, the EASHG was applied to 30 pregnant women diagnosed with HSP undergoing monitoring in the high-risk outpatient clinic of a University Hospital (UH) in the southern region of the country, in their own room, favoring privacy and not compromising assistance.

The sample was established for convenience, by means of an active search conducted by the researcher in the UH's outpatient service. The inclusion criteria were as follows: pregnant women with an HSP diagnosis, over 18 years old, and being monitored in the high-risk prenatal outpatient service. Pregnant women with a foreign nationality were excluded from the sample due to difficulties with language and, consequently, with the reliability of the semantic assessment of EASHG.

After completing the EASHG scale, each pregnant woman was asked about eventual doubts regarding the words and items that comprised it; they were also asked about its clarity, comprehension, and suggestions for improving the instrument. After semantic validation, the pilot instrument was elaborated.

The pilot instrument was applied to a portion of the target population, with the objective of determining the quality of the instrument as a whole; this phase is called experimental procedures[5]. According to a study[5], it is recommended that the sample should be large enough so that the static analyses are not impaired; thus, it is suggested that 10 participants are needed for each item of the scale – as the scale has 26 items, at least 260 participants were required to meet the study inclusion criteria.

The data obtained from the pilot instrument were subjected to statistical analysis and this stage (called analytical procedures) aims at verifying reliability and trustworthiness[5]. The last stage for the construction and validation of the instrument within the analytical procedures was performed by factor analysis, to measure the internal consistency of the EASHG items, whose indicator was Cronbach's alpha, for being more used to determine the precision of an instrument[5]. With the support of a statistician, data analysis was performed in SPSS® version 20.0.

This study is part of a PhD thesis approved in the Committee of Ethics in Research with Human beings, under opinion No. 2,323,689.

RESULTS

In the first stage, the scale is composed of three domains, consisting of 13 items each, totaling 39, whose objective is to identify the self-efficacy of pregnant women in preventing complications resulting from HSP. These items were assessed by the evaluators during the two content validation rounds.

Four evaluators took part, all female, being nurses specialized in Obstetrics and with master's or PhD degrees. Their mean training time was seven years, varying from three to 12 years, with a standard deviation of ±3.77 years. Their mean age was 32 years old, varying from 26 to 40, with a standard deviation of ±5.92 years old.

The agreement percentage among the evaluators was calculated in order to verify the pertinence of the items proposed in each domain of EASHG and their relevance in the assessment of the pregnant women's self-efficacy with HSP. EASHG presented a mean agreement score of 94%, varying from 90% to 98%, as shown in Table 1. Therefore, the results show acceptable agreement among the evaluators.

Table 1 – Analysis of the items and agreement percentage by each domain of the scale in the evaluators' first analysis round. Curitiba, PR, Brazil, 2020

Domains	Items	Items excluded	Agreement (%)
Drug treatment	13	1	98
Prenatal care	13	2	94
Lifestyle	13	5	90
Total	39	8	94

Source: The authors (2020)

It can be observed that the evaluators' agreement percentage remained within the acceptable parameters: above 80%. The domain with the most items with agreement for exclusion was related to lifestyle; however, the highest percentages of agreement for the excluded items were in the other two domains, as shown in Table 2.

Table 2 – Analysis of the items and agreement percentage by each domain of the scale in the evaluators' second analysis round. Curitiba, PR, Brazil, 2020 (continues)

Domains	Items	Items excluded	Agreement (%)
Drug treatment	12	1	95

Prenatal care	11	1	95
Lifestyle	8	3	81
Total	26	5	90.33

Source: The authors (2020)

After the exclusions of the second round of content evaluation by the judges, EASHG remained with a total of 26 items. During the second round, the judges discussed and proceeded with the reclassification of the items in relation to the distribution in each domain, presented in Table 3.

Table 3 – Reclassification of the items in relation to the domains after the evaluators' analysis. Curitiba, PR, Brazil, 2020

Domains	**Items**
Drug treatment	12
Prenatal care	8
Lifestyle	5
Total	26

Source: The authors (2020)

Consequently, the new version of EASHG, with 26 items, was applied to 30 pregnant women for its semantic validation. The mean time taken by the pregnant women to answer the instrument was five minutes.

Regarding the profile of the pregnant women who participated in the semantic validation of EASHG, their mean age was 33.4 years old, with 14 (46%) aged between 36 and 40 years old, 21 (70%) married/in a consensual union, and 22 (73.3%) living in the city where the research was carried out. Regarding schooling, the majority, 13 (43.3%), reported having completed high school; exercising some paid activity, 21 (70%); and with incomes ranging from one to three minimum wages, 20 (66.6%).

After filling out the instrument, in the process of verifying the participants' understanding and notes for improvement, the absence of doubts or suggestions was unanimous; therefore, EASHG remained with 26 items. With the completion of the theoretical procedures and the elaboration of the pilot instrument, the stage of experimental procedures was initiated. The participants were 262 pregnant women, whose answers were computed and submitted to the analyses.

The age of the pregnant women varied from 18 to 46 years old, with the most predominant age group being between from 32 to 38 years old (35.87%), 149 (56.10%) performed paid work activities and 186 (71%) had a family income ranging from one to three minimum wages.

Of the 26 items submitted to the analytical procedures, nine were excluded for at least one of the following reasons: unbalanced distribution between answer categories;

non-significant and/or too high/too low negative correlation coefficients.

After deleting the items, the remaining 17 were subjected to internal consistency analysis, according to the domains in which they were relocated, shown in Chart 1. It is observed that the values in between parentheses at the end of each item description are the numbers that the items received in the final version of EASHG.

Chart 1 – Item-total correlation coefficient, alpha value of the total items of the Scale of Self-efficacy in Pregnant Women for Hypertensive Syndromes in Pregnancy, and alpha values if the item is excluded. Curitiba, PR, Brazil, 2020 (continues)

EASHG items	Item-total correlation	Cronbach's alpha if the item is excluded
Total Cronbach's alpha for EASHG 0.58		
Domain: Drug treatment	**0,620**	
I take the medication only when I feel that pressure is high/altered (10)	0,246	0,565
I forget to take the medications when I'm doing other activities (11)	0,052	0,597
I stop taking the medication prescribed when I feel that pressure is under control (12)	0,171	0,576
I don't take my medication correctly because I take too long to get/buy it (17)	0,057	0,591
Domain: Prenatal care	**0,668**	
During prenatal care, I was instructed regarding the possible complications that might occur in my pregnancy due to high pressure (3)	0,252	0,563
I'm aware of the importance of the medication to control my pressure and preserve my health (4)	0,356	0,546
I know the risks of pregnancy with hypertension (8)	0,313	0,553
Domain: Intervention based on common sense	**0,541**	
I take the medications that my friends, neighbors or relatives tell me to control my blood pressure (1)	0,12	0,582
When I feel that my pressure is high, I take one extra pill than prescribed (6)	0,171	0,576
I drink the teas that my friends, neighbors or relatives tell me to control my blood pressure (7)	0,21	0,571
Domain: Understanding of the recommendation with support from the famil	**0,607**	
I have support from the people who live with me to take the medication, according to the prescription, at the correct dose and times (9)	0,44	0,527
I started taking the medication immediately after the doctor prescribed it (15)	0,32	0,549
Domain: Lifestyle	**0,537**	
I try to carry out activities that make me feel at ease (14)	0,215	0,57
I avoid excessive weight gain during pregnancy (16)	0,255	0,562
Domain: Dietary intervention	**0,564**	

My partner and the people I live with help me to follow a diet with fruits, vegetables and legumes (2)	0,169	0,578
I eat fruits, vegetables and legumes every day, in addition to other foods (13)	0,101	0,588
Domain: Self-care		
I go to the health unit when I don't feel well (4)	0,072	0,591

Source: The authors (2020)

After performing the aforementioned procedures, EASHG was submitted to standardization so that the results could be interpreted. The instruments' scores were classified in order to identify the low, moderate and high self-efficacy levels. In view of this classification, it is possible to establish an association between the scores obtained by the pregnant women and the prevention of complications resulting from HSP, as shown in Chart 2.

Chart 2 – Standardization of the Self-efficacy levels, according to the values obtained by the pregnant women in the Scale of Self-efficacy in Pregnant Women for the Prevention of Complications resulting from Hypertensive Syndromes in Pregnancy, PR, Brazil, 2020

Values obtained in EASHG	Self-efficacy levels
≤ 31	Low
32-37	Moderate
≥ 38	High

Source: The authors (2020)

DISCUSSION

After an extensive bibliographical review, it was possible to identify a deeper study of the study object, "Prevention of Complications resulting from Hypertensive Syndromes in Pregnancy" and thus, in the end, operationalize the construct in items[6].

A total of 39 items were elaborated during the theoretical procedures, distributed into three domains: Drug treatment, Prenatal care, and Lifestyle. To format the instrument, it was defined that it would be answered using a three-point Likert scale, varying from zero to three, in terms of agreement with the statement, where (1) I disagree, (2) Sometimes I agree and (3) I agree. In this way, the higher the score, the greater the pregnant woman's self-efficacy.

The 39 items were submitted to the evaluators' assessment for content analysis. The suggestions were related to the wording of the items and their readaptation in the domains. The agreement percentage was higher than the minimum 80% rate and the judges' critical evaluation allowed improving the scale, corroborating with other scales that were built and validated based on psychometrics[7-8] and in scales that have been translated

and adapted[9-10].

For the judges who carried out the validation, EASHG presented sufficient and necessary information on the topic, in line with Brazilian methodological research studies on the construction and validation of instruments[11-12]. The Brazilian research studies converge with the research carried out with patients in the Netherlands and Belgium, which report the validation of a self-efficacy scale for diabetes control in patients with Type 2 Diabetes[13], and in Croatia, regarding the construction and validation of a self-efficacy scale for swimming[14].

After both analyses, EASHG ended up having 26 items and was thus applied to the 30 pregnant women, who approved the scale during semantic assessment.

In content validation, there was agreement that the instrument has a compatible language because, when considering the existence of specific terms in the health area, it is necessary to use language that is clear for pregnant women. This was proved in the semantic validation, in the evaluation by the participants and in the reduced time needed for them to complete the scale. During analysis, it was possible to observe that EASHG has an adequate textual presentation for the educational and cultural level of the target population benefited.

During the analytical procedures, and after carrying out the factor analysis, EASHG went from three to seven domains: Drug treatment, Prenatal care, Intervention based on common sense, Understanding of the recommendations with support from the family, Lifestyle, Dietary intervention, and Self-care.

The Drug treatment domain has four items that refer to how pregnant women understand the importance of using the medication and observe times and doses, in addition to knowledge of possible adverse effects and access to medication, avoiding anxiety[15].

The Prenatal care and Intervention based on common sense domains have three items each; in the first, it is possible to identify if the pregnant woman recognizes the importance of the assistance she receives in prenatal care, and the second addresses the social influence on the pregnant woman, in which the family is inserted, its routine, its values, and also the established ways of caring and in the spoken memory, passed on from generation to generation[1,16].

The Lifestyle domain refers to the set of habits and customs that are influenced, modified, encouraged or inhibited by the prolonged socialization process[17]. In Dietary intervention, the pregnant women are recommended healthy eating and physical activity during pregnancy, so that they remain healthy and avoid excessive weight gain[18]. Each of these domains has two items.

On the other hand, Self-care has as its principle taking care of oneself, showing concern[19]. Self-care is only understood as essential when people become aware of the need to stay well and healthy[20]. This domain has one item.

Strategies for the prevention of HSP must be carried out and encouraged in order to stimulate early diagnosis, continuous treatment, blood pressure control through lifestyle modification, and regular use of medications[21].

EASHG's Cronbach's alpha coefficient, which was 0.58, points to the instrument's low internal consistency. This value reveals that the alpha value can be influenced by several reasons, which can interfere with the instrument's reliability both positively and negatively[22].

This alpha value is confirmed when the item-total analysis is performed, in which it can be seen that, even when one of the items is excluded, the value remains homogeneous, varying between 0.527 and 0.597. Assessing the possible reasons for this coefficient and according to the frameworks used, the way to improve reliability would be to increase the

number of subjects.

Regarding the standardization of the scale's results, for each item evaluated, the pregnant woman receives a variable score from 1 to 3 points according to the agreement degree. Therefore, the total EASHG scores vary from 17 to 51 points, considering that the final version of the scale consists in 17 items (Annex 1).

Pregnant women with higher scores have high self-efficacy, that is, they are those who are more confident in their ability to prevent complications in hypertensive syndromes.

With the increase in the number of pregnant women with HSP, the health services are faced with the challenge of providing individualized and quality care. Scales are essential instruments to help advance knowledge about the subject to be assisted, as well as to contribute to the implementation of the most appropriate care to their needs.

Regarding the study limitation, it is understood that, as the sample for validation is restricted to a single high-risk public reference service for pregnant women diagnosed with HSP, different results can be found when applying EASHG to pregnant women assisted in the private sector, for example, encouraging new studies to expand the validity of this scale.

CONCLUSION

This study enabled the validation of an unprecedented instrument, which can help both nurses and the multidisciplinary team in the development of safe and individualized care actions for high-risk pregnant women. It can also foster discussions on the theme, identifying the points where it is necessary to direct care actions to pregnant women, in addition to planning intervention strategies and public policies.

Content and semantics analysis conferred greater reliability to EASHG, in addition to enabling the interaction between theory and practice, providing greater understanding of the HSP universe.

Thus, EASHG proposes to assess pregnant women in a multidimensional way, observing the different aspects related to health and, in this study, it attained satisfactory validity levels, meeting all recommendations proposed by the methodological framework. It is noteworthy that, although this study shows positive results, it is necessary to apply EASHG in a larger and diversified sample of the target population to infer generalizations.

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ANNEX 1

Scale of Self-efficacy in Pregnant Women for the Prevention of Complications resulting from Hypertensive Syndromes in Pregnancy (EASHG). Thuler, Wall, 2020 (continues)

Please choose the answer that best describes the extent to which you can prevent the complications resulting from hypertensive syndromes in pregnancy. Mark your answer with an X by the number closest to how you feel.
There are no correct or incorrect answers.

		I disagree	I sometimes agree	I agree
1	I take the medications that my friends, neighbors or relatives tell me to control my blood pressure.	1.☐	2.☐	3.☐
2	My partner and the people I live with help me to follow a diet with fruits, vegetables and legumes.	1.☐	2.☐	3.☐
3	During prenatal care, I was instructed regarding the possible complications that might occur in my pregnancy due to high pressure.	1.☐	2.☐	3.☐
4	I'm aware of the importance of the medication to control my pressure and preserve my health and my baby's health.	1.☐	2.☐	3.☐
5	I go to the health unit when I don't feel well.	1.☐	2.☐	3.☐
6	When I feel that my pressure is high, I take one extra pill than prescribed.	1.☐	2.☐	3.☐
7	I drink the teas that my friends, neighbors or relatives tell me to control my blood pressure.	1.☐	2.☐	3.☐
8	I know the risk of pregnancy with hypertension.	1.☐	2.☐	3.☐

9	I have support from the people who live with me to take the medication, according to the prescription, at the correct dose and at the correct times.	1.☐	2.☐	3.☐
10	I take the medication only when I feel that pressure is high/altered.	1.☐	2.☐	3.☐
11	I forget to take the medications when I'm doing other activities.	1.☐	2.☐	3.☐
12	I stop taking the medication prescribed when I feel that pressure is under control.	1.☐	2.☐	3.☐
13	I eat fruits, vegetables and legumes every day, in addition to other foods.	1.☐	2.☐	3.☐
14	I try to do activities that make me feel at ease.	1.☐	2.☐	3.☐
15	I started taking the medication immediately after the doctor prescribed it.	1.☐	2.☐	3.☐
16	I avoid excessive weight gain during pregnancy.	1.☐	2.☐	3.☐
17	I don't take my medication correctly because I take too long to get/buy it.	1.☐	2.☐	3.☐

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