

## NURSES' ATTITUDINAL AND NORMATIVE BELIEFS CONCERNING HEMODYNAMIC ASSESSEMENT BY PULMONARY ARTERY CATHETERIZATION<sup>1</sup>

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*The objective of this study was to identify, by using the Theory of Reasoned Action/Theory of Planned Behavior, the attitude and normative beliefs that influence the behavioral intention of the nurse to perform a hemodynamic assessment using the pulmonary artery catheterization. Data were collected through semi-structured interviews involving 23 nurses from three hospitals in the city of Campinas, São Paulo. The data were analyzed according to a qualitative methodology. Among the Attitude Beliefs, affective beliefs and those related to the advantages and disadvantages of performing the behavior stand out. Among the Normative Beliefs social referents were identified for the behavior, as well as the behavior-stimulating factors and the factors that discourage the performance of the behavior.*

**DESCRIPTORS:** nursing care; intensive care; catheterization, Swan-Ganz; behavior

## CREENCIAS NORMATIVAS Y DE ACTITUD DE LOS ENFERMEROS SOBRE EL ESTUDIO HEMODINÁMICO POR MEDIO DEL CATÉTER DE ARTERIA PULMONAR

*El objetivo de este estudio fue identificar, por medio de la Teoría del Comportamiento Planificado, las creencias normativas y de actitud que contribuyen para la formación de la intención de comportamiento del enfermero en realizar el estudio hemodinámico (EH) por medio del catéter de la arteria pulmonar. Los datos fueron obtenidos a través de entrevista semi estructurada de 23 enfermeros de unidades de terapia intensiva de tres hospitales del municipio de Campinas-São Paulo. Los datos fueron analizados según la metodología cualitativa. Entre las Creencias de Actitud se destacaron las creencias afectivas y aquellas relativas a las ventajas y desventajas de la realización del comportamiento. En las Creencias Normativas se evidenciaron los referentes sociales para la ejecución del comportamiento, así como factores estimulantes y que no estimulan la realización del EH.*

**DESCRIPTORES:** cuidados de enfermería; cuidados intensivos; cateterismo de Swan-Ganz; conducta

## CRENÇAS ATITUDINAIS E NORMATIVAS DOS ENFERMEIROS SOBRE O ESTUDO HEMODINÂMICO POR MEIO DO CATETER DE ARTÉRIA PULMONAR

*O objetivo deste estudo foi identificar, por meio da Teoria da Ação Racional/Teoria do Comportamento Planejado, as crenças de atitude e normativas que contribuem para a formação da intenção comportamental do enfermeiro em realizar o estudo hemodinâmico (EH) por meio do cateter de artéria pulmonar (CAP). A coleta de dados foi realizada por meio de entrevista semi-estruturada junto a 23 enfermeiros de unidades de terapia intensiva de três hospitais do município de Campinas, SP. Os dados foram analisados segundo metodologia qualitativa. Dentre as crenças de atitude destacaram-se as crenças afetivas e aquelas relativas às vantagens e desvantagens da realização do comportamento. Nas crenças normativas foram evidenciados os referentes sociais para a execução do comportamento, bem como fatores estimuladores e desestimuladores da realização do EH.*

**DESCRIPTORES:** cuidados de enfermagem; cuidados intensivos; cateterismo de Swan-Ganz; comportamento

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## INTRODUCTION

Safe, rapid and reliable bedside monitoring of physiological parameters through a pulmonary artery catheter (PAC) has become essential for managing critical patients in the last 30 years. However, at the end of the 1980's, the first inquiries were raised about its use, as studies<sup>(1-2)</sup> reported higher mortality rates among patients monitored with the catheter, leading to recommendations to suspend PAC use<sup>(3)</sup>. The lack of randomized research in this area made scientific societies and specialists recommend randomized studies to prove PAC efficacy<sup>(4)</sup>.

Recent studies at evidence level I were inconclusive about PAC efficacy<sup>(5-6)</sup>. Nevertheless, literature reports that health professionals' limited knowledge on PAC management<sup>(7-9)</sup> has impaired catheter efficacy assessment. Hence, educational programs have been recommended to train these professionals in order to interpret the hemodynamic variables provided by the PAC<sup>(9-10)</sup>.

Critical care nurses frequently mention difficulties to carry out hemodynamic studies (HS) using PAC, as well as the underutilization of obtained data in nursing care planning.

Studies have been realized to identify nurses' technical and conceptual knowledge about the PAC<sup>(7-8)</sup>, but there are no reports on what conditions and knowledge they consider necessary to perform HS. As health behaviors do not exclusively depend on knowledge, it is important to get to know what factors contribute to the formation of nurses' behavioral intent to perform HS.

Among theories that study behavior, the Theory of Reasoned Action<sup>(11)</sup> (TRA) stands out. According to these frameworks, the intention to realize a certain behavior is a function of the following factors: 1. Attitude – formed by attitudinal beliefs, which refers to the individual's positive or negative assessment of the consequences of behavior; and 2. Subjective Norm – formed by normative beliefs, which refers to perception of the social pressure to perform the behavior.

It is presupposed that behavior is a function of salient information or beliefs relevant for its occurrence. Hence, a deeper understanding of the beliefs people develop throughout their lives provides fundamental support to obtain information about behavioral determinants, as these beliefs make it possible to recognize factors inducing a person to get involved (or not) in a certain behavior.

The identification of factors contributing to the formation of nurses' behavioral intention to perform

HS can support the outlining of effective educational interventions, which will consequently result in the optimization of nursing care quality for critical patients monitored through PAC. This study aims to present the TRA elements, that is, the attitudinal and normative beliefs that contribute to the formation of nurses' behavioral intention to perform HS by means of PAC.

## CASUISTICS AND METHOD

### Place of study

Data were collected at adult Intensive Care Units (ICUs) of two public and one private hospital located in Campinas, a large urban center with about one million inhabitants in the Southeast of Brazil.

### Subjects

Participants were 23 nurse clinicians who had delivered care to at least three PAC patients in the last four months and agreed to participate by signing the. Professionals on health leave or any other leave of absence were excluded. The sampling process was intentional, using the saturation criterion to determine sample size<sup>(12)</sup>.

### Data collection

Data were collected through semistructured interviews, using an instrument structured according to TRA premises and submitted to content validation<sup>(12)</sup>. Seven experts with renowned knowledge in critical patient care evaluated the instrument by. A pretest was performed with three nurse clinicians from adult ITUs to assess the interviewees' understanding of the instrument. Interviews were held individually, protecting subjects' privacy, taperecorded and later transcribed. All subjects enrolled signed the Free and Informed Consent Term and the study was approved by the local Research Ethics Committee.

### Data analysis

Data were analysed using a qualitative approach<sup>(13)</sup>, according to the following steps:

1. Transcription, reading and rereading of interviews, highlighting meanings that answered to the proposed inquiries;
2. Comparison among different subjects' discourse to identify the common and most frequent meanings, which were coded into units of

meaning; 3. Grouping of units of meaning into thematic subcategories; 4. Grouping of thematic subcategories into central thematic categories, *a priori* established according to TRA premises, within the thematic units corresponding to TRA constructs.

mean age 32.2 ( $\pm 6.6$ ) years, average graduation time 8.0 ( $\pm 5.6$ ) years, and with length of experience in ICU of 5.1 ( $\pm 4.8$ ) years. Fifty subjects (65.2%) mentioned a *lato sensu* post graduate level of schooling.

**RESULTS**

The 23 subjects were mainly women; with

The beliefs related to HS performance behavior are presented according to the two Central Thematic Units, which were *a priori* established according to TRA elements and their respective Central Theme Categories (Table 1).

Table 1 - Synoptic table of central thematic units: Attitudinal and normative beliefs and their respective central theme categories

Central thematic units	Attitudinal beliefs	Normative beliefs
Central Theme Categories	Advantages of realizing HS	Social referents stimulating the realization of HS
	Disadvantages of realizing HS	Social referents discouraging the realization of HS
	Crenças afetivas em relação à realização do EH	Fatores que estimulam a realização do EH Fatores que desestimulam a realização do EH

Thematic Unit: Attitudinal beliefs

*Advantages of realizing HS*

The analysis of answers about the advantages evidenced the subcategories: Advantages for patients, Advantages for Physicians and Advantages for nurses.

In relation to the patients, the analysis revealed that one of the advantages of PAC is the possibility of guiding treatment with precision, as PAC

use permits obtaining accurate hemodynamic data. This contributes to define the diagnosis, guide therapeutical conduct and medication use. As to the Advantages for physicians subcategory, we observed that the same units of meanings as in Advantages for patients were reproduced. Among the few Advantages for nurses, contribution to nursing care and to professional learning stood out.

Disadvantages of realizing HS

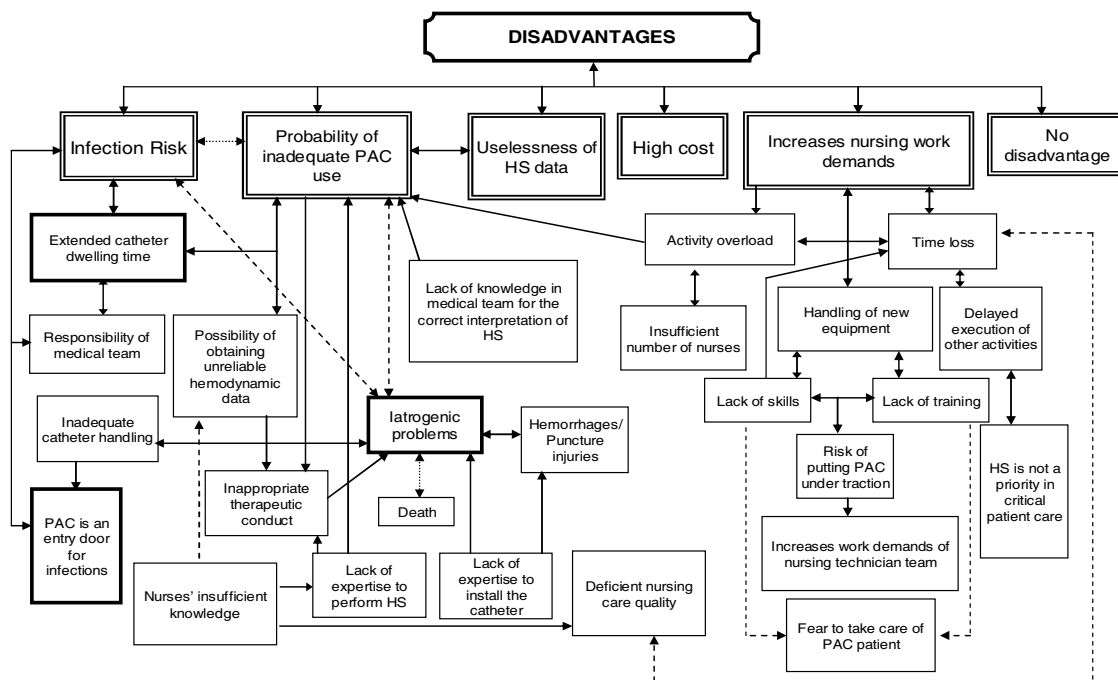


Figure 1 - Central theme category: Disadvantages of the behavior

The subcategories grouped in this theme category are presented in Figure 1. Infection risk was the most prevalent subcategory in subjects' discourse, and was strongly associated with extended catheter dwelling time and inadequate catheter handling. The medical team was considered responsible for extended catheter dwelling time, which can lead to the possible obtention of unreliable hemodynamic data and, consequently, inadequate therapeutic conducts: *...many people don't know how to use it, ... the catheter should be kept in place for a specific time, then there's people who want to leave it for 5-6 days... then the value is no longer reliable and... in fact, that catheter just continues as a way of infection, and does the patient more harm... because then he can produce a changed value, and misleading medical decisions regarding the treatment (E1).*

Disadvantages of performing HS were frequently associated with the increase in nurses' work

demands. Performing hemodynamic studies is supposed to overload nurses, as it implies handling new equipment, requiring technique and training. Lack of equipment handling skills and inexistence of training programs lead to time loss, as they contribute to delays in the execution of other activities. These meanings contribute to the fact that performing HS is not considered a priority in nursing care for critical patients. Reduced PAC handling skills were associated with fear of care delivery to patients monitored with a PAC: *... everybody's afraid of taking, of assuming the patient, why? Because then, at the time of the study, you'll have to handle the machine, and they're so afraid, ... afraid of the machine, /.../ if you take care like with any other catheter, the machine in itself, the maximum that can happen is that you'll have to do it several times... (E3).*

*Affective Beliefs related to realizing HS*

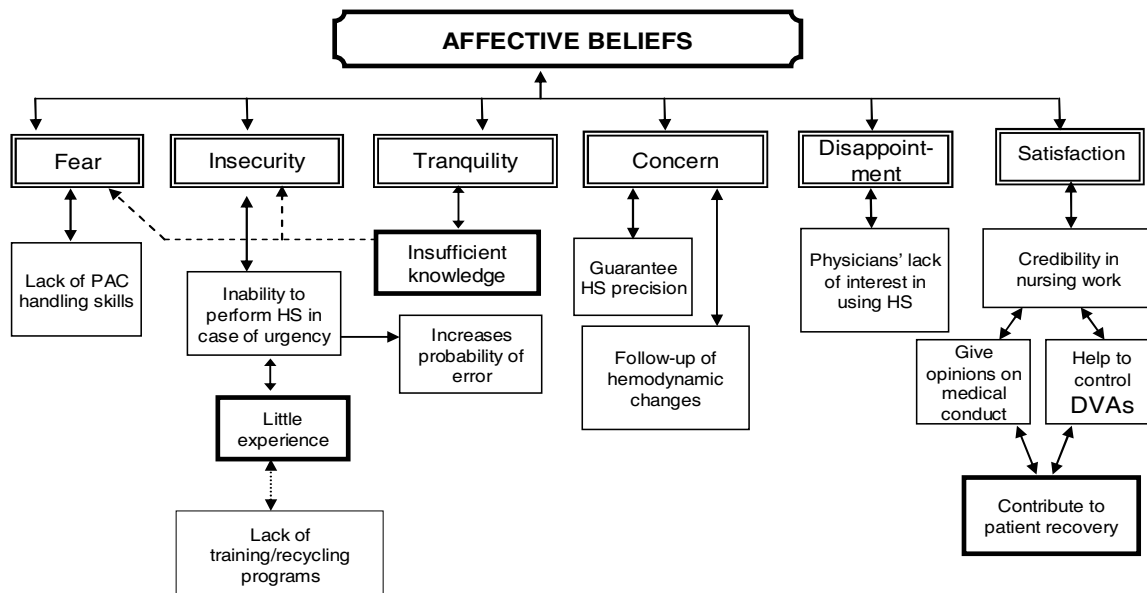


Figure 2 - Central theme category: Affective Beliefs

The subcategories associated with this theme category are presented in Figure 2. A negative affect in relation to the realization of HS was evidenced; feelings like fear, insecurity, concern and disappointment were mentioned. Insecurity was associated with inability to perform HS in urgency situations, leading to increased error probability. Fear was associated with lack of PAC handling skills and with nurses' lack of knowledge about PAC. The feeling of disappointment was linked with the physician's not using HS data to guide therapeutic conduct. Among positive beliefs, satisfaction about performing the

behavior stands out, related to credibility in nursing work.

Thematic unit: Normative Beliefs

*Social referents stimulating behavior*

Nurses themselves, professionals using HS data, physicians and patients were indicated as positive social referents. Nurses were considered as positive social referents because they are interested in hemodynamic variables to elaborate their care plan.

Professionals using HS data are also positive referents, as they stimulate other professionals' learning.

Physicians stimulating the realization of HS constitute positive referents because they are perceived as the ones responsible for requesting these studies, offering learning opportunities to nurses and giving credit to nursing work; patients, in turn, stimulate the realization of HS when they make nurses acknowledge their responsibility for appropriate treatment within the institution. For some subjects, there is nobody stimulating the behavior, due to the fact that the procedure is considered as part of nurses' routine or duties: *...Nobody asks, nobody stimulates, we have our function, of doing this study to...in order to improve the clinical situation... (E2).*

*Social referents discouraging the behavior*

The medical team, other health professionals who do not work in teams, the permanent education service and nurse heads were indicated as negative

social referents. For some subjects, there is nobody discouraging the realization of HS. The medical team discourages the behavior when they do not use HS data to guide treatment, when they present knowledge deficits, when they demonstrate that they do not like to teach and when they do not trust nurses' work: *...Medical area, sometimes you say "do you want me to do a cardiac output?" they say "ah... there's no need"...if he's not interested... it's discouraging... a lot (E13).*

The physician's lack of credibility in nursing work was implicitly associated with nurses' knowledge deficit to handle PAC. Other negative social referents were the permanent education service and nurse heads, which were considered inefficient in nurses' technical-scientific training. For some of the interviewees, there is nobody discouraging the performance of HS: *the discouragement comes... from supervision, because... I wasn't trained /.../ There's very little for nursing, so if we want something, we have to go for it, ask and generally it's to the doctor (E5).*

*Factors stimulating the behavior*

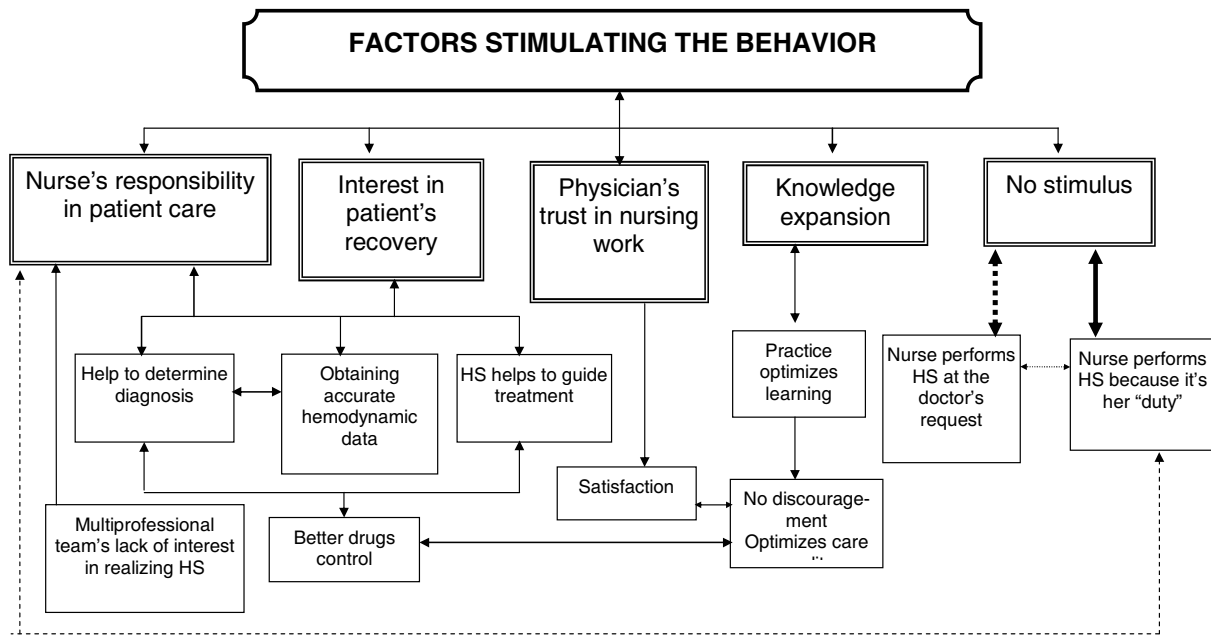


Figure 3 - Central theme category: Factors stimulating the behavior

Figure 3 schematically presents the subcategories associated with this theme category. Nurses' responsibility in patient care is one of the factors that stimulate the behavior, as it helps to guide treatment, especially in terms of better control of vasoactive drugs, which was associated with care quality optimization: *...it stimulates... I need to know about*

*what's going on with the patient, ... inclusively because of drugs handling... it is not just knowing the pulmonary artery or pulmonary capillary pressure level, I have to understand what is happening, know a bit about the patient's disease, because that is going to influence the results (E23).*

The physician's trust in nurses' work was considered a behavior-stimulating factor because it

causes the feeling of satisfaction. Greater knowledge about HS, obtained by practicing the behavior periodically, also revealed to stimulate the behavior. These two subcategories were associated with the optimization of nursing care quality.

For some subjects, there is nothing stimulating

the behavior, since they believe that the nurse only performs HS at the doctor's request. This indeed contributes to her considering the realization of the behavior as "obligatory".

*Factors discouraging the behavior*

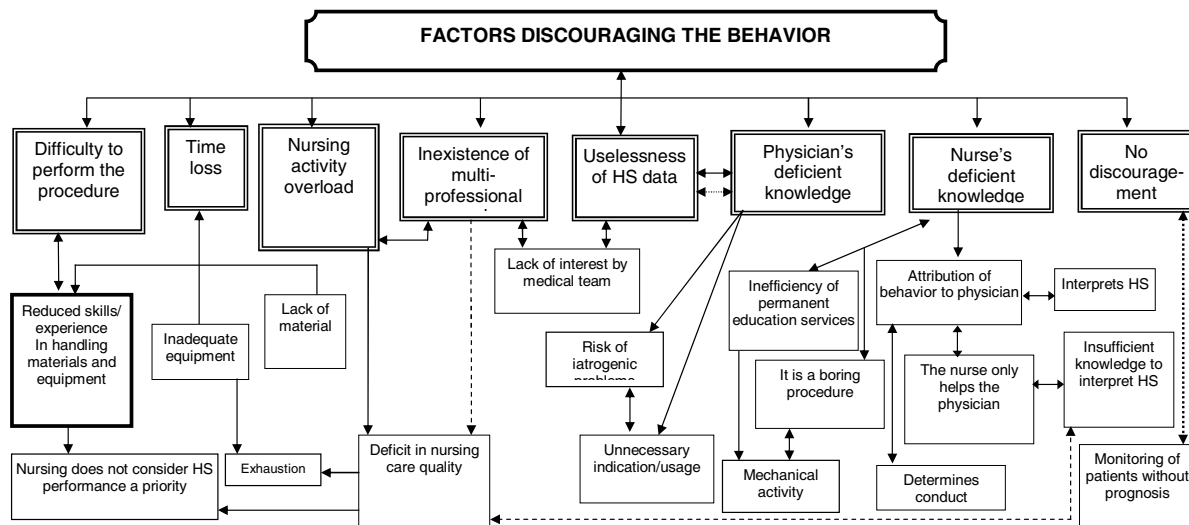


Figure 4 - Central theme category: Factors discouraging the behavior

Figure 4 presents the subcategories and units of meaning highlighted in this category. One of the factors recognizing as discouraging the behavior is the difficulty to perform the procedure, frequently associated with reduced skills and experience in handling hemodynamic monitoring materials and equipment, which seems to contribute to the fact that realizing HS is not considered as a priority in nursing interventions involving critical patients: *...we waste time... it delays all of our work. So, when there is a patient with Swan-Ganz, we end up postponing the realization of the study like, when the shift almost changes, because if you lose time... your shift changes and you leave (E3).*

Nurses' work overload and knowledge deficit about PAC were also mentioned, the latter deriving from the inefficiency of permanent education services to develop training and recycling programs, which makes nurses attribute the behavior of performing HS to the physician, while nurses are only responsible for helping him to realize the procedure: *...it's not like a huge problem, provided that you get... training before... (E22).*

## DISCUSSION

This study revealed the existence of beliefs that permeate the behavior of performing HS, both in

terms of the subject's attitude towards the behavior and the social referents that stimulate or discourage its realization.

Among positive attitudinal beliefs, the advantages of using PAC in critical patients stood out, especially with respect to their contribution to the outlining of patient interventions. HS' positive contribution to patient treatment, in turn, was associated with a positive affect in relation to the behavior, resulting in tranquility in patient care. These findings point towards the acknowledgement of the importance of PAC use in patient treatment.

However, this acknowledgement occurs amidst many disadvantages nurses associate with HS. These observations strengthen the premises of the adopted theoretical reference framework<sup>(11)</sup>, according to which attitudinal beliefs are formed from positive and negative meanings people attach to the realization of a behavior.

Moreover, in the assessment individuals make before performing the behavior, negative beliefs tend to exert a stronger impact than positive beliefs, and the latter tend to exercise greater influence on long-term decisions, while the former are more predominant in short-term decisions<sup>(14)</sup>. When considering the decision to perform HS a short-term resolution, the high prevalence of negative

beliefs can influence a negative motivation among nurses to realize the behavior. The disadvantages of realizing HS were mainly associated with the risks of catheter use and increased nursing work demands.

The subjective norm suggests greater possibilities that a subject will execute a behavior when he believes that important people expect him to perform the behavior<sup>(15)</sup>. In this study, the physician emerged as an important positive social referent and was acknowledged as the professional who teaches and trusts nurses' work, contributing to their learning.

The unit of meaning – physician's request – was the most salient in the interviewees' discourse as a stimulus to perform HS. This information evidences that nurses realize HS on the basis of the physician's assessment and at his request. For some participants, this was one of the only factors stimulating the behavior. It seems incongruent that nurses indicate the doctor's request as a stimulus to perform HS, as nurses possess autonomy to realize HS and they are expected to interpret the collected data in order to support nursing interventions.

On the other hand, the physician was also considered as a negative social referent, who discourages the realization of HS, mainly in the absence of a link with multiprofessional work and/or when he does not know or does not use data obtained through the PAC to guide critical patient treatment. Although the importance of the social referent should be acknowledged to perform certain behaviors, frequent references to the physician as a stimulus/discouragement or even mediating affective beliefs about the performance of HS seem to contribute to remove nurses' focus from their responsibility to perform and interpret HS.

Lack of knowledge and skills in PAC patient care were beliefs that permeated the disadvantages of the behavior, as well as negative affection with HS. These points towards the relevance of nurses' scientific recycling, if not as a determinant factor of behavior, then as a factor that contributes to training the behavior, as well as to motivation to perform it through the development of positive affection. In this context, the function of permanent education services must be emphasized, which should be especially important in nurses' recycling. However, our data showed that permanent education service

professionals and nurse heads have also been considered as referents discouraging the realization of HS, particularly due to their inefficiency in helping nurses to acquire and improve PAC handling knowledge and skills.

The health team's inadequate use of hemodynamic data has aroused the interest of international scientific societies, as the knowledge deficit related to PAC handling is one of the main factors difficulting catheter efficacy assessment, which has led to recommendations to improve these professionals' knowledge and, mainly, to review and modify training and permanent education methods<sup>(10)</sup>.

Training and permanent education methods need to change, considering that education programs to improve technical-scientific knowledge have not been satisfactory in retaining and/or expanding professionals' knowledge<sup>(16)</sup>. The identification of beliefs and factors influencing adherence to the behavior is essential to guide the development of intervention programs that could be effective in optimizing and guaranteeing the accomplishment of important procedures or techniques in professional practice<sup>(15-17)</sup>.

Hence, the results of this study allow us to infer that the teaching methods permanent education services use about PAC management need to be reassessed and restructured. Thus, it seems adequate to recommend that educational programs make an effort to provide technical-scientific contents but, also, that the elaboration of such programs considers factors motivating, permitting and strengthening the nurses' behaviors to adopt a specific behavior. It is important for this recycling to be directed at the development of clinical reasoning, making nurses self-confident about their competence and, therefore, able to participate in decision-making processes about critical patient care, together with their peers and the interdisciplinary team, in an equalitarian and autonomous way.

In a future study, these data will contribute to the construction of a psychometric scale to assess the magnitude of each set of beliefs in the determination of this behavior. Identifying the most intense beliefs will permit the design of educative interventions aimed at strengthening positive beliefs and transforming beliefs in a positive sense for the behavior.

## REFERENCES

1. Gore JM, Goldberg RJ, Spodick D, Alpert JS, Dalen JE. A community-wide assessment of the use of pulmonary artery catheters in patients with acute myocardial infarction. *Chest* 1987; 92(4):721-7.
2. Connors AF, Speroff T, Dawson NV, Thomas C, Harrell FE, Wagner D, et al. The effectiveness of right heart catheterization in the initial care of critically ill patients. *J Am Med Assoc* 1996; 276(11):889-97.
3. Dalen JE, Bone RC. Is it time to pull the pulmonary artery catheter? *J Am Med Assoc* 1996; 276(11):916-8.
4. Bernard GR, Sopko G, Cerra F, Demling R, Edmunds H, Kaplan S, et al. Pulmonary artery catheterization and clinical outcomes: National Heart, Lung and Blood Institute and Food and Drug Administration. *J Am Med Assoc* 2000; 283(19):2568-72.
5. Sandham JD, Hull RD, Brant RF, Knox L, Pineo GF, Doig CJ. A randomized, controlled trial of the use of pulmonary-artery catheters in high-risk surgical patients. *N Engl J Med* 2003; 348(1):5-14.
6. Richard C, Warszawski J, Anguel N, Deye N, Combes A, Barnoud D, et al. Early use of the pulmonary artery catheter and outcomes in patients with shock and acute respiratory distress syndrome: a randomized trial. *J Am Med Assoc* 2003; 290(20):2713-20.
7. Iberti TJ, Daily EK, Leibowitz AB, Schechter CB, Fischer EP, Silverstein JH. Assessment of critical care nurses' knowledge of the pulmonary artery catheter. *Crit Care Med* 1994; 22(10):1674-8.
8. Burns D, Burns D, Shively M. Critical care nurses' knowledge of pulmonary artery catheters. *Am J Crit Care* 1996; 5(1):49-54.
9. Squara P, Bennett D, Perret C. Pulmonary artery catheter: does the problem lie in the users? *Chest* 2002; 121(6):2009-15.
10. American Society of Anesthesiologists Task Force on Pulmonary Artery Catheterization. Practice guidelines for pulmonary artery catheterization. *Anesthesiology* 2003; 99(4):988-1014.
11. Ajzen EN, I. Attitudes, personality and behaviour. Chicago (IL): Dorsey Press; 1988.
12. Turato ER. Tratado da metodologia da pesquisa clínico-qualitativa. Petrópolis (RJ): Vozes; 2003.
13. Patton MQ. Enhancing the quality and credibility of qualitative analysis. *Health Serv Res* 1999; 34(5):1189-208.
14. Ajzen I. Nature and operation of attitudes. *Annu Rev Psychol* 2001; 52:27-58.
15. Godin G, Naccache H, Morel S, Ébacher MF. Determinants of nurses' adherence to Universal Precautions for venipunctures. *Am J Inf Control* 2000; 28(5):359-64.
16. Dwyer T, Williams LM. Nurses' behaviour regarding CPR and the theories of reasoned action and planned behaviour. *Resuscitation* 2002; 52(1):85-90.
17. Rossato-Abéde LM, Angelo M. Crenças determinantes da intenção da enfermeira acerca da presença dos pais em unidades neonatais de alto-risco. *Rev Latino-am Enfermagem* 2002 janeiro-fevereiro; 10(1):48-54.