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RESEARCH

Exploring the CASCADA Model in nurses and physicians on traditional midwifery: A qualitative study

Exploración del Modelo CASCADA en enfermeras y médicos sobre partería tradicional: un estudio cualitativo

Explorando o Modelo CASCADA em enfermeiros e médicos sobre obstetrícia tradicional: um estudo qualitativo

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Abstract

Introduction. In hard-to-reach indigenous communities in the state of Guerrero, Mexico, traditional birth attendants are the only trained personnel available for prenatal care and childbirth. The importance of linking nurses and physicians with traditional birth attendants arises from the inability of health systems to provide maternal care, especially in rural areas. **Objective**. Explore the Model of Knowledge, Attitudes, Subjective Norms, Intention to Change, Agency, Discussion and Action –CASCADA- in nurses and physicians regarding traditional midwifery in Xochistlahuaca, Guerrero. **Methodology**. Qualitative and descriptive study. Twenty-one in-depth interviews were conducted: 11 with physicians and 10 with nurses from the Basic Community Hospital and Health Centers of Xochistlahuaca, following the CASCADA model. The selection criterion involved medical personnel having contact with traditional birth attendants in the last twelve months. The work observed ethical guidelines and principles related to studies involving human participation. For the assessment, a priori codes and categories were identified. **Results**. Health personnel, aware of the loss of traditional midwifery, expressed positive and negative attitudes toward traditional birth attendants; health workers reported that traditional midwifery is worth developing, showed intention to change behavior, and presented the capacity to implement it. **Conclusions**. Health workers recognized that the decline in traditional midwifery would lead to more complications in pregnant women and even more maternal deaths, so they were willing to undertake behavior change actions to develop traditional midwifery.

Key words: Midwifery; Health personnel; Nurses (DeCS).

Resumen

Introducción: En comunidades indígenas de difícil acceso del estado de Guerrero, México, las parteras tradicionales son el único personal capacitado disponible para el cuidado prenatal y partos. La importancia de la interrelación de enfermeras y médicos con parteras tradicionales surge de la incapacidad del sistema de salud de prestar atención materna en áreas rurales. **Objetivo**: Explorar el Modelo Conocimientos, Actitudes, Normas Subjetivas, Intención de Cambio, Agencia, Discusión y Acción -CASCADA- en enfermeras y médicos respecto a la partería tradicional en Xochistlahuaca, Guerrero. **Metodología**: Estudio cualitativo descriptivo. Se realizaron 21 entrevistas en profundidad a personal médico y de enfermería de un Hospital Básico Comunitario y Centros de Salud, siguiendo el modelo CASCADA. El criterio de selección implicó que el personal médico tuviera contacto con parteras tradicionales en los últimos doce meses. El trabajo se apegó a lineamientos y principios éticos vinculados con estudios que involucran la participación en humanos. Se identificaron códigos y categorías a priori para el análisis. **Resultados:** El personal de salud, consciente de la pérdida de la partería tradicional, manifestó actitudes positivas y negativas hacia las parteras tradicionales; los trabajadores de la salud reportaron que vale la pena desarrollar la partería tradicional, mostraron intención de cambio de comportamiento y presentaron la habilidad para implementarlo. **Conclusiones:** El personal de salud reconoció que la disminución de parteras tradicionales ocasionaría más complicaciones en embarazadas e incluso, más muertes maternas, por lo que estuvo dispuesto a realizar acciones de cambio de comportamiento para desarrollar la partería tradicional.

Palabras clave: Partería; Personal de salud; Enfermeras y enfermeros (DeCS).

Abstrato

Introdução: Em comunidades indígenas de difícil acesso no estado de Guerrero, no México, as parteiras tradicionais são o único pessoal qualificado disponível para cuidados pré-natais e de parto. A importância da inter-relação entre enfermeiros e médicos e parteiras tradicionais surge da incapacidade dos sistemas de saúde em prestar cuidados maternos, especialmente nas zonas rurais. **Objetivo.** Explore o modelo de Conhecimento, Atitudes, Normas Subjetivas, Intenção de Mudança, Agência, Discussão e Ação –CASCADA- em enfermeiras e médicos em relação à obstetrícia tradicional em Xochistlahuaca, Guerrero. **Metodologia**. Estudo qualitativo e descritivo. Foram realizadas 21 entrevistas em profundidade: 11 com médicos e 10 com enfermeiras do Hospital Básico Comunitário e Centros de Saúde de Xochistlahuaca, seguindo o modelo CASCADA. O critério de seleção envolveu equipe médica que teve contato com parteiras tradicionais nos últimos doze meses. O trabalho observou as diretrizes e os princípios éticos relacionados a estudos que envolvem a participação humana. Para a avaliação, foram identificados códigos e categorias a priori. **Resultados**. A equipe de saúde, ciente da perda da obstetrícia tradicional, expressou atitudes positivas e negativas em relação às parteiras tradicionais; os profissionais de saúde relataram que vale a pena desenvolver a obstetrícia tradicional, demonstraram intenção de mudar o comportamento e apresentaram a capacidade de implementá-la. **Conclusões**. Os profissionais de saúde reconheceram que a diminuição do número de parteiras tradicionais causaria mais complicações nas mulheres grávidas e ainda mais mortes maternas, razão pela qual estavam dispostos a realizar acções de mudança comportamental para desenvolver a obstetrícia tradicional.

Palavras-chave: Obstetrícia; Pessoal de Saúde; Enfermeiros e Enfermeiras (DeCS).

Introduction

The shortage of qualified health personnel to provide primary health care services is a recurrent situation in Mexico [(1)]. According to the United Nations Population Fund, the personnel dedicated to sexual, reproductive, maternal, neonatal and adolescent health cannot meet the global needs for essential care in this field of health and, if there are no significant changes, the gap between high and low-income countries will widen in the coming years [(2)]. The deficit of health sector personnel in Mexico amounts to almost 300,000 nurses and 200,000 physicians [(3)]. Traditional midwifery (TM) is a key medical practice in maternal health care in rural populations with little access to health services [(4)]. In hard-to-reach indigenous communities, traditional birth attendants (TBAs) are the only trained personnel available for prenatal and delivery care [(5)].

A traditional midwife, in addition to attending the delivery of the pregnant woman, participates in the entire gestation process, detects health risks and refers to the health sector when they occur, so she plays an important role in community life in indigenous contexts [6]. The reasons why TBAs are required in their community are because of their accessibility, both because of their proximity and low cost, and because of the trust, respect and affection that the community has for them [7]. However, TM is a disappearing practice in Latin America [8].

In 2020, nurses or TBAs assisted around 75 thousand deliveries in Mexico, a figure that represented 4.6 % of the total number of deliveries in the country [9]. In the same year, the proportion of births assisted by nurses or TBAs in the state of Guerrero was 12 % of the total number of births in the state [9]. Although it is difficult to estimate the number of TBAs, it is considered that there are about 15,000 in Mexico [10]. However, TM has been attenuated and does not guarantee a safe delivery in all cases [5].

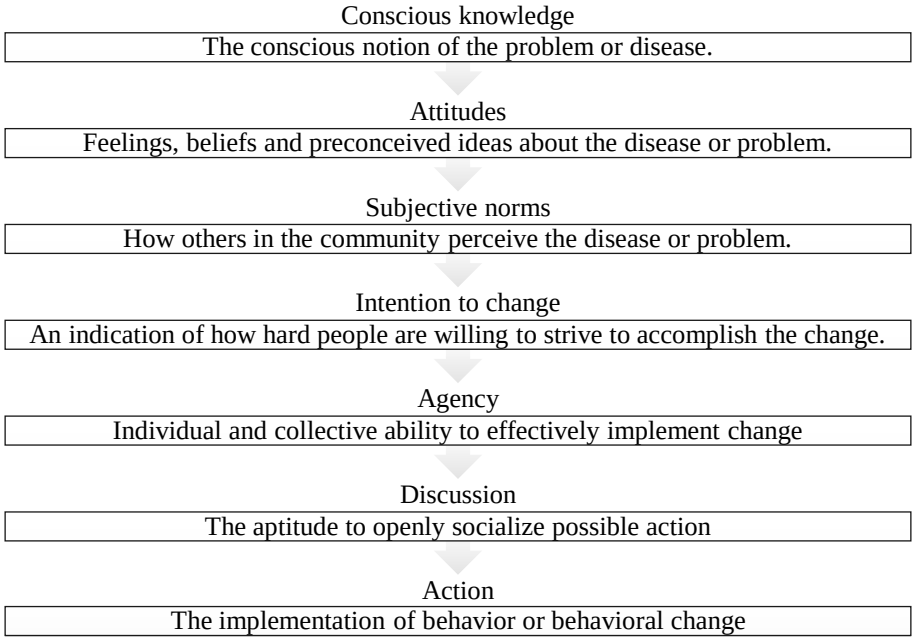
Studies have shown that greater interaction between TBAs and formal health services can reduce complications in childbirth in women from indigenous communities [11]. In addition, it has been found that women attended by nurses together with TBAs had a reduced probability of cesarean delivery and a greater probability of breastfeeding within the first hour after birth [12]. The importance of the interrelationship of nurses and physicians with TBAs arises from the inability of health systems to provide maternal care, especially in rural areas [13].

Between 1986 and 2005, more than 172 theories or models of health-related behavior were identified [14], although only very few were used in multiple publications and by various authors. Of these theoretical formulations, the dominant ones were the Health Belief Model, the Social Cognitive Theory formerly called Social Learning Theory, the Theory of Reasoned Action or Theory of Planned Behavior, the Transtheoretical or Phases of Change Model, among others. These theories try to determine the factors that intervene in the decisions of individuals that impact on

their health, incorporate concepts such as attitudes, behavioral intentions, knowledge, experience, consequences, among others, and are still used in health behavior research today.

The Knowledge, Attitudes, Subjective Norms, Intention to Change, Agency, Discussion and Action (CASCADA) model takes up the conventional constructs of the theory of planned behavior and the knowledge, attitudes and practices model to measure attitudes and changes in health behavior in order to generate action [15]. According to this model, a series of intermediate measurable steps that, although not always linear and not always predictable a priori, lie between knowledge and behavior change. The intermediate elements or variables of CASCADA are Conscious Knowledge, Attitudes, Subjective Norms, Intention to Change, Agency, Discussion and Action, (Figure 1).

Figure 1. CASCADA model elements, 2022



Source: Own-development taken from Pimentel, et al [15].

This model maintains that behavior change is essentially a social outcome, so it is reasonable to encourage discussion or socialization prior to the implementation of the action [15]. The application of behavioral change models such as CASCADA could help in the development of effective

interventions to achieve behavioral change and of procedures to evaluate the impact of these interventions.

Likewise, to improve the availability, accessibility, and acceptability of health services in indigenous communities in Mexico, both qualitative and quantitative research is needed on the perceptions and attitudes that nurses and physicians have toward TBAs [16]. This research will provide knowledge about the interrelationship between health professionals, such as nurses, and community human resources, such as TBAs, for the benefit of maternal and neonatal health in hard-to-reach indigenous populations in Mexico. The objective of this study was to explore what are the knowledge, attitudes, subjective norms, intentions for change, agency, discussion and action in nurses and physicians regarding TM in Xochistlahuaca, Guerrero.

Methodology

This is qualitative research with a phenomenological design, which allows the understanding of the lived experience and the search for awareness and meanings around a phenomenon [17]. The data collection technique was the in-depth interview, which consists of asking a series of open-ended questions to capture experiences and perceptions from the perspective of the individuals involved [18]. The study context was the municipality of Xochistlahuaca in the state of Guerrero in Mexico. This municipality has a basic community hospital located in the municipal capital, and six health centers located in different localities; however, during the fieldwork two of these did not have medical personnel assigned to them, and the health centers included were: Cozoyoapan, Guadalupe Victoria, Los Liros, and Arroyo Grande.

The study participants included maternal health physicians and nurses assigned to the health services. The selection criteria implied that the medical personnel had contact with TBAs in the last twelve months. The sample was saturated with twenty-one interviews: nine female nurses, one male nurse and eleven physicians (five men and 16 women).

The design of the interview guide was based on the seven components of the CASCADA Model, the topics, guiding questions and objectives, which made up the in-depth interview are presented in Table 1.

Table 1. A priori categories, questions and objectives associated with the interview guide, 2022, (n=21)

Categories a priori (Components)	A priori codes (Attributes)	Questions	Purpose
Problem knowledge	Awareness of the problem Loss of TM Working together to improve TM	Do you see the loss of traditional midwifery as a problem for your community? Why? What do you think would happen if there were no traditional birth attendants in this community? Do you consider that the joint work of doctors and traditional midwives develops traditional midwifery? Why?	To identify whether health personnel are aware of the decrease in TM, what the loss of TM represents, and whether they consider that the joint work of health personnel and TBAs improves medical practice.
Attitudes	Positive attitudes Negative **attitudes** Discrimination Willingness to refer pregnant women with TBAs Attitude to TBAs and their traditions	Do you think there is discrimination by health personnel against traditional birth attendants or traditional medicine? Why? Would you make adequate use of community human resources, such as midwives and traditional doctors with respect for their traditions and world vision? Why?	To know the perception of the health personnel about the TBAs, if there is discrimination towards them, if they are willing to take advantage of them with respect to their traditions and if they refer a woman to them.
Subjective Norms	Perception of colleagues to develop or not the TM	Do you think your colleagues in health care think the development of traditional midwifery is worthwhile?	Find out if health personnel considers that colleagues think that TM development is worthwhile.
Intention to Change	Willingness to cross-cultural training Willingness to work together with TBAs	Would you be willing to train professionally from a cross-cultural perspective? Why? Would you work together and on equal terms with traditional birth attendants to improve maternal health in your community? Why?	To know if they are willing to be trained from a cross-cultural perspective and if they are willing to work together.
Agency (ability to change)	Responsible for the validity of the TM	Who do you think is responsible for keeping the practice of traditional midwifery current? Why?	Identify the health personnel's point of view on who should be responsible for the prevalence of the TM.
Discussion	Conversations on the future of TM	Have you discussed the future of traditional midwifery with your colleagues in health care? Why?	To find out if the health personnel have discussed the future of the TM with their colleagues in the health sector.
Action	Willingness to meet or not to meet with TBAs	Would you attend meetings, workshops and talks with traditional birth attendants to discuss the development of traditional midwifery? Why?	To know the willingness of health personnel to meet with TBAs.

Source: Own-development

The research was approved by the ethics and research committee of the Research Center with folio 009-22. The work adhered to the ethical guidelines and principles related to studies involving the participation of human beings, guaranteeing respect, dignity and confidentiality of the information shared by the participants. Authorization was granted by the director of the hospital and health

centers to conduct the fieldwork between the months of march and april 2022. In addition, the interviews were conducted in the physicians' offices and at the nurses' desks. These were recorded and field notes were made at the end of each interview. The average duration of each meeting was 40 minutes. Subsequently, all the information was transcribed, coded, and categorized. The Atlas.ti version 23.0 program was used for the analysis of the results. The assessment was based on the a priori identification of codes and categories, retaining those that achieved theoretical saturation. For the assessment, all categories were retained, some a priori codes were removed, while some emerging ones were included. At the end of the assessment, a triangulation of results was performed and approved by the consensus of four expert researchers in the study area.

In terms of participant characteristics, the average age was 39 years, 52 % worked in the basic community hospital of Xochistlahuaca and 48 % in different health centers, all of them were directly related to maternal health care. Twenty-four percent were bilingual, speaking Spanish and ñomndaa, and 76 % spoke only Spanish, (Table 2).

Table 2. Interviews with health personnel in the municipality of Xochistlahuaca, 2022 (n=21)

Participant	Healthcare personnel	Gender	Age	Workplace	Speaks native language
N1	General Practitioner	M	30	CS Cozoyoapan	No
N2	Nurse	F	34	CS Cozoyoapan	No
N3	Nurse	F	54	CS Cozoyoapan	Yes
N4	Nurse	F	45	CS Cozoyoapan	Yes
N5	Nurse	F	38	CS Guadalupe Victoria	No
N6	General Practitioner	F	31	CS Guadalupe Victoria	Yes
N7	Nurse	M	54	CS Guadalupe Victoria	No
N8	Nurse	F	27	CS Los Liros	No
N9	General Practitioner	M	62	HB Communitarian	No
N10	General Practitioner	F	28	HB Communitarian	No
N11	Nurse	F	35	HB Communitarian	No
N12	General Practitioner	M	42	CS Arroyo Grande	No
N13	Nurse	F	38	CS Arroyo Grande	Yes
N14	General Practitioner	F	36	CS Los Liros	No

Continue table 2…

N15	General Practitioner	F	32	HB Communitarian	No
N16	General Practitioner	M	39	HB Communitarian	No
N17	General Practitioner	F	35	HB Communitarian	No
N18	Nurse	F	30	HB Communitarian	No
N19	General Practitioner	F	37	HB Communitarian	No
N20	Nurse	F	50	HB Communitarian	Yes
N21	General Practitioner	F	49	HB Communitarian	No

Source: Own-development.
Note: Health Center=CS, Basic Hospital=HB

Results

In the conscious knowledge of this problem, three relevant aspects that shed light on the knowledge of the problem were identified: a) health personnel recognized the decline in the number of TBAs, b) the significance of the loss of this practice for the community, and c) the recognition that working together would develop TM. Most of the health personnel were of the opinion that working together would allow TBAs to improve their medical practice, generate more confidence in pregnant women and have fewer complications in childbirth, as mentioned by a nurse:

N5: "Yes [it would improve medical practice], because for example the women here speak the Amuzga language, the midwives do the same and I imagine they trust them more and they understand them more".

Health personnel stated that the loss of TM would result in greater complications for pregnant women and even more maternal deaths. In addition, most said that it is difficult for pregnant women to travel to health institutions, and several mentioned that pregnant women would give birth alone or with the help of their husbands if there were no TBAs in their community. One participant stated:

N20: "Well, it would be a problem because of the distance between the hospital and each town, or sometimes there is no transportation to bring them to the hospital. They would have to travel, so sometimes they arrive with retained placenta or bleeding.

Additionally, health personnel considered the TBAs important, they provide support to their work, so for them the loss of the TM does represent a problem. One physician stated:

N16: "It would increase maternal deaths. Because pregnant women would hardly come down here to the Hospital, because sometimes they decide to have it at home, sometimes they are not going to have that person and that confidence to tell them how they feel, and that is what the midwife is trained for, to identify signs and symptoms of alarm, and when that and when that figure is no longer available, pregnant women would have more complications".

Regarding the attitudes of health personnel towards TM, positive attitudes were identified such as willingness to refer a patient to TBAs, they are considered important for the community, there is no discrimination, there is confidence in their work, they have practice and experience in maternal health care, there is recognition of the work of TBAs, and willingness to take advantage of them in health institutions. Health personnel were more willing to refer pregnant women to TBAs when they know or work with them. Health personnel expressed that they do not discriminate against TBAs; on the contrary, they have sought to work together, have taken advantage of opportunities to train some of them, recognize their practice and consider them as a support for their work in the community. Health personnel recognized the trust and good care provided by the TBAs to pregnant women and would be willing to take advantage of the TBAs in health institutions. One of the participants said:

N18: "Yes [I would be willing to take advantage of the TBAs in health institutions]. Because if the people here know them, they tend to trust them more, usually the midwives who are here or with whom I have contact are people from the same town [so] I can said that they are trusted.

However, some mentioned that there were negative attitudes towards TBAs such as: isolated cases of discrimination, rejection, insecurity and distrust on the part of some members of the health personnel towards them. Although discrimination towards TBAs was not generalized, there were

some cases of rejection and distrust among the health personnel, mainly due to lack of training of the TBAs, having presented complications with a pregnant woman, different perspectives and ways of treating medicine. In this regard, a nurse said:

N13: "From our point of view, no [there is no discrimination], but in some health teams, perhaps yes, because there is a lack of coordination with their midwives".

Subjective norms. Health personnel stated that other colleagues would consider that it would be worthwhile to improve TM because of the socio-cultural and economic characteristics of the municipality, since the localities of Xochistlahuaca are considered high-risk indigenous areas due to the level of marginalization and the deficiency of health services, and because of the insufficient number of personnel in hospitals and health centers. In addition, the health personnel stated that other colleagues perceived that there would be benefits from the practice of TM if there were greater support and joint work between the health personnel and the TBAs, since it would facilitate the prevention of complications and maternal deaths and because TBAs will always exist. In this regard, a nurse from a health center stated the following:

N2: "Yes [colleagues think it is worth improving the TM], because it would help us a lot to prevent maternal deaths, which is something that happens a lot here in this area, because sometimes they [pregnant women] do not tell us [that they are pregnant]".

In behavioral change intention, health personnel were willing to carry out actions for change. Health personnel were willing to receive cross-cultural training and work together with the TBAs. They also felt that cross-cultural training is a benefit for the entire population of the municipality and not only for pregnant women. Some health workers are indigenous ñomndaas, so cross-cultural training means learning more about their culture and returning to their origins. For health workers, working together with TBAs would help to improve the service to pregnant women and prevent complications or maternal deaths:

N4: "Yes [I would work together with TBAs], because we would prevent maternal deaths, because we would be more in contact with them, because we are in the same area, and we all want a common benefit".

In agency, health personnel were aware of having the ability to implement change, they recognized the co-responsibility, along with the government and the TBAs, to keep the TM in place. Health personnel are aware that they are in charge of providing health services to pregnant women in the community, but they know that pregnant women do not always go to the health institutions and in some cases, they are the only trained personnel available to attend them, so they showed interest in improving the TM. According to health personnel, the TBAs are co-responsible for being a millenary practice that is inherited from generation to generation. The population is also responsible as TM is a benefit for the community. Thus, one of the nurses stated:

N3: "Well, we are interested in people's health from this point of view, because the health sector [responsible for keeping the TM current], because we are very affected when a pregnant woman attends only with the midwife and if she does not receive good care when she arrives with us, she is already dying and they will say that the Ministry of Health was to blame, but sometimes we are not able to check 100% of all pregnant women, and worse when they do not come with us, we do not know what is happening with them.

In discussion, it could be seen that the future of TM is a topic that is rarely talked about within health personnel. Except for the personnel with decision-making capacity on maternal health programs in the municipality, TM is a topic that is not talked about or discussed among health personnel. In this regard, a physician said:

N19: "It had not thought of discussing this topic, because I had not noticed with your question that, if there is a future for midwifery, because I would not have taken it into account that they are

really older ladies who were born and there are no young people other than those who have come to the hospital to do their service, a contract that I know are midwives".

In action, health personnel had the willingness to meet with TBAs for development, however health personnel perceived the meetings as an opportunity to train them in the care of pregnant women, share experiences, listen to their opinions and learn more about TM. One nurse said:

N2: "Yes [I would be willing to attend meetings with TBAs], because we would let them know the importance of caring for a pregnant woman, the complications they could have, where to go in case of an emergency, notify them so that they also know what to do in case of an emergency."

The most relevant results were that health personnel recognized the decline in TBAs, the significance of the loss of TM for the community and that working together would develop this practice. Health personnel had positive attitudes towards TBAs such as willingness to refer a patient with them, and the negative ones were rejection, discrimination and distrust. Health personnel thought that it would be worthwhile to develop TM because of the socio-cultural and economic characteristics of the municipality and the benefits it would bring, they were willing to be cross-culturally trained and work together with the TM, they recognized the co-responsibility together with the TBAs and the government to keep TM current and finally, health personnel talked very little about the topic of TM. However, they were willing to meet with the TBAs to listen to them and train them in health care, (Table 3).

Table 3. Components of the CASCADA Model and their identified characteristics, 2022

Acronym	CASCADA Model Component	Characteristics identified in the results
C	Conscious awareness of the problem	Recognition of the decline in the number of TBAs, the significance of the loss of the practice to the community, and the recognition that working together would develop the TM.
A	Attitudes of health personnel toward traditional midwifery	Positive attitudes towards TM. Willingness to refer a patient with TBAs, important for the community, no discrimination, trust, practice and experience in maternal health care, recognition of the work of TBAs and willingness to take advantage of them in health institutions. Negative attitudes towards TM. Isolated cases of discrimination, rejection, insecurity and distrust on the part of some health personnel towards them.

S	Subjective norms	The development of TM is worthwhile. Because of the socio-cultural and economic characteristics of the municipality and the insufficient personnel in hospitals and health centers and because of the benefits of TM such as prevention of complications and maternal deaths, greater support and joint work between health personnel and TBAs, and the consideration that TBAs will always be around.
C	Intention to change behavior	Willingness to train cross-culturally and work together with TBAs: Cross-cultural training is a benefit for the entire population. Working together would help to improve service to pregnant women.
A	Agency	Ability to implement change. Recognition of the co-responsibility with the TBAs and the government to keep the TM in force. Health personnel know that in some cases the TBAs are the only trained personnel available to attend pregnant women, so they are interested in improving TM. The TBAs are also responsible as TM are a millenary practice that is inherited from generation to generation. The population is also responsible as TM is a benefit for the community.
D	Discussion	Socialization of the problem. Health personnel talk very little about the issue of TM or the future of TM.
A	Action	Willingness to meet with TBAs. Meetings are an opportunity to train and listen to TBAs.

Source: Own-development.

Discussion

Based on the objective of exploring the CASCADA model in nurses and physicians with respect to TM, the results suggest that both nurses and physicians are aware of the situation of TM in their community and have the intention to change their behavior in order to develop this practice. They are aware of the importance and what the loss of TM would represent for maternal health; this may be the reason why health personnel show the intention to change their behavior; some studies [19,20] indicated that knowledge of a health risk contributes to people's commitment to change their behavior. According to health personnel, the loss of TM would cause greater complications and even maternal deaths; this situation is consistent with that reported by a study in Mexico [5]. Health personnel considered that working together with TBAs would help preserve TM and improve the quality of health services, which is consistent with what was reported in other studies with TBAs in indigenous communities in Mexico [12] and Guatemala [21].

The positive attitude of health personnel toward TM contrasts with the attitudes of physicians elsewhere; a study in Jordan showed opposition to changing legal provisions in favor of fairer laws

for TBAs [22]. Positive and negative attitudes of health personnel toward TBAs are consistent with the acceptance and rejection stances of health personnel toward the professionalization of TBAs [23]. Negative attitudes such as resistance to recognition and rejection of TBAs are consistent with those expressed by TBAs from different regions of Mexico [24].

Health personnel recognized that it is worthwhile to improve (subjective norm) the TM because of its sociocultural characteristics and because of the trust that pregnant women have in them, as they are members of the same community, thus, sharing their language and customs; this corresponds to the acceptance and trust that pregnant women in Mexico and other countries have with TBAs in their own localities [4,7,25].

Health personnel showed the intention (to change) to train interculturally through courses against racism and on indigenous culture, in this regard, a study in Ecuador revealed that the integration of intercultural practices, in addition to positively changing the attitudes and behaviors of health personnel towards indigenous women, could facilitate their access to maternity services and improve maternal and neonatal health results [26].

Health personnel were aware that they have the ability (agency) to implement change, they recognized that they are also co-responsible for the development of TM, agreeing with researchers [27] who reported the co-responsibility of health personnel and health services in the training of TBAs and nurses to reduce maternal and infant mortality.

The future of TM is a topic that is rarely discussed among health personnel; studies have corroborated that interpersonal discussion of a health risk, or a preventive measure leads to a behavioral change that positively affects health [28]. Health personnel intended to meet (action) with the TBAs and health authorities, this would be useful to train them in medical care and establish communication in case of emergencies, which is consistent with other studies [1,11] in concluding that training and integration of the TBAs into the health system would reduce perinatal mortality

and improve maternal health. Encouraging discussion among health personnel about TM or about the risks involved in their disappearance could encourage health personnel to try to develop this practice.

Among limitations of the research, it was found that the information was collected in one municipality of the state of Guerrero, reducing the generalization of the study, in addition, the ethnic identification of health personnel was not deepened nor were possible gender and age differences of health personnel established; however, it provides knowledge about the attitudes and intentions of behavioral change of health personnel on TM and contributes to generate qualitative evidence on the CASCADA model applied **to** health personnel. **For** future research, it is suggested to implement an intervention that involves actions by health personnel to measure the impact of the CASCADA model on health personnel for the development of TM, as well as to use a mixed methodology in representative samples of health personnel to provide the necessary evidence to design programs in favor of TM in indigenous communities.

Conclusions

Health personnel are aware of the decline of TBAs and that their absence would cause more complications in pregnant women and even more maternal deaths in Xochistlahuaca, Guerrero. Health personnel expressed both positive and negative attitudes towards TM, thought that it was worthwhile to improve TM, and showed willingness to implement behavioral change actions, such as cross-cultural training, working together with TBAs, and meeting with them to discuss actions for their development. Nurses and physicians were aware that they have the ability to implement change, yet TM is a topic that is rarely talked about in health systems. Encouraging discussion about TM or the risks involved in its disappearance could encourage health personnel to develop this practice.

The results of this study could have important implications for nursing practice; health personnel should be aware and recognize that TBAs perform maternal health care services in areas with poor access to health services. Collaboration between health workers and TBAs could be a way to jointly fight for the reduction of maternal mortality in indigenous communities with difficult access to health services.

Conflict of interests

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