Midwifery and Medicinal Plants in the Mazahua and Otomi Indigenous Group of the State of Mexico

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Abstract: The purpose of this study was to analyze midwifery practice in the Mazahua and Otomi (MO) indigenous community and its relationship with the persistence of the native language and the use of medicinal plants. A semi-structured survey with qualitative and quantitative information was designed and validated. Data were collected from the students enrolled in the Intercultural Health Degree at the Intercultural University of the State of Mexico, their parents, their grandparents, and people from their community of the MO ethnic group. The variables mother tongue and births attended by midwives among both MO and non-indigenous people were correlated with three generations (grandparents, parents, and grandchildren). In the MO indigenous group, births attended by midwives and mother tongue concerning the three generations were lost in proportions of 25.5% and 17.05%, respectively. There are 23% more midwife-attended births in the MO community than among non-ethnic people. The medicinal plants most used by the MO indigenous group are “too” (Montana tomentosa Cerv.) and “lengua de vaca” (Rumex crispus L.). As regards family economy, 79.3% of the adults surveyed consider that there is a saving of between 25% and 75% with midwifery practice in the MO community. There is a generational correspondence between the loss of native language and midwifery practice.

Keywords: high-priority development communities; family economy; indigenous traditional health

1. Introduction

Midwifery practice in the traditional medicine of indigenous groups has strong cultural and social connotations. For indigenous cultures, the gestation, childbirth, and puerperium are events that involve modesty; hence, a woman should be attended by a midwife (Medina et al. 2001). Therefore, midwifery is a profession performed only by women who have achieved great prestige for this activity, which generates trust in the community (WHO et al. 1985).

Women who are trained as midwives have a non-formal education; it is an empirical learning process (Eslava 1998), and most of this learning is acquired through their own experiences or accidental circumstances that forced them to attend a birth. The training, experience, and transmission of their knowledge in midwifery from parents to children represent, for their communities, an alternative for both savings in the family economy and support of the health system (Laza Vásquez 2012; UNFPA 2012). The midwife’s knowledge is comprehensive, as it involves knowledge of physiology, childbirth care, and cosmovision elements of each culture; therefore, attention is also given to the spirit
(García et al. 2018). Within their beliefs’ legacy, they demonstrate special dedication and commitment to responding to women’s needs (Botteri and Bochar Pizarro 2019). In addition, there is a strong link between the midwifery profession and herbal knowledge. Plants are employed for primary health care (Gheno-Heredia et al. 2011), and during childbirth, the mother is provided with infusions that help the process of the baby’s birth (Laza Vásquez 2012). The traditional midwife is a substantive part of indigenous traditional medicine; she provides a complete health system with a whole traditional model of care for women during pregnancy, childbirth, and puerperium, along with the herbalists that contribute to traditional medicine and Mexican herbal medicine (CNDH México 2019).

There is a cultural barrier between conventional physicians and the population, both ethnic and rural. That is, in the rural regions, traditional care during pregnancy, childbirth, and the postpartum period is considered to be an intimate event in a woman’s life that involves her modesty and is assumed to come under women’s affairs (Laza Vásquez 2012). This has been recognized by health personnel. They affirm that in rural areas, midwives are an important support enabling the health sector to enter the community, since they have the trust of the people, and they know the organization and the culture surrounding maternity. Midwives facilitate the implementation of health campaigns in rural regions (Laureano-Eugenio et al. 2016).

Factors that have endangered the practice of midwifery throughout history have been the advance of Western medicine, women’s exclusion from medical practice, the creation of professional midwifery (which includes the practice of midwifery within the career of Medicine and Surgery), and a lack of quantitative information on this skill (INSP 2016). In San Luis Potosí, México, it is reported that the permanence of traditional midwifery has to do with insufficient medical personnel and health centers, inaccessible medical centers, and lack of knowledge of the cultures served (Pelcastre et al. 2005).

In Mexico, the National Institute of Statistics and Geography in 2020 for birth registration in México (INEGI 2020), in its item of personnel who attended births (comparison between physicians and midwives/nurses), reported that 87.8% were attended by physicians and 5.1% were attended by nurses or midwives; the remaining percentage was not specified. The report describes a decrease in the share of midwives/nurses from 32% in 1985 (68% attended by physicians) to 4.6% (95.4% attended by physicians), a drop of 0.91% per year.

Traditional medicine and midwifery are ancestral practices that are performed in indigenous communities as part of their uses and customs, with the native language being the main medium of transmission of traditional medicine and herbal knowledge. With the loss of indigenous languages, the set of environmental, technological, social, economic, and cultural knowledge that their speakers have accumulated and codified over millennia inevitably disappears (UNESCO 2019; Rodríguez-Zúñiga et al. 2023). Over the years, conventional medicine has incorporated them as a complementary system to allopathic medicine. Formal and traditional health systems coexist and attend gestation, childbirth, and the puerperium (García et al. 2018), and the traditional system has been recognized by the former (WHO 2013). Although there have been some attempts to discredit midwifery, its permanence outside health centers is due to the fact that in clinics or health units, women do not receive comprehensive care during gestation. Midwifery is often the only health service available, since those provided by the state are difficult to access and of low quality for the population living in rural areas. Recognizing the work of traditional midwives and training them correctly, along with professional midwives, could help prevent around two-thirds of all maternal and neonatal deaths (Medina et al. 2001; WHO et al. 1985; Botteri and Bochar Pizarro 2019; Laureano-Eugenio et al. 2016). This group of indigenous women contributes to avoiding newborn malnutrition in marginalized areas. The breastfeeding period is longer in indigenous peoples than in other regions (e.g., in Chihuahua, on average, the Rarámuris have a breastfeeding period of 15 months, compared to 6.9 months in state health institutions). With this, good nutrition is guaranteed during the first years of life (IBFAN 2018).
This research was carried out in the Mazahua and Otomi (MO) indigenous community in the region of the State of Mexico. This area concentrates the largest population of these two ethnic groups, which have a great tradition of the use of medicinal plants (MP) by midwives (INEGI 2020; Rodríguez-Zúñiga et al. 2023). The use of MP for curative purposes by native peoples like the MO evidences the relationship between human beings and nature (Ramírez 2008). The Mazahua and Otomi midwives have a vital role in their communities; their knowledge of herbal medicine and midwifery allows them to provide specialized care to women during pregnancy, childbirth, and the postpartum period, as well as treating conditions related to the reproductive system (Miranda 2021). In this sense, the process of accompanying women before and after pregnancy by Mazahua and Otomi midwives is carried out in a consensual framework with the “patient”, with mystical–religious dimensions and distinctive practices of the use of herbal medicine and traditional medicine (Medina et al. 2001; Pujadas-Ríos et al. 2011).

In this context, the aim of this study was to analyze the practice of midwifery in the Mazahua and Otomi indigenous community and its relationship with the persistence of the native language and the use of medicinal plants. The hypothesis is that in this exercise of ancestral medicine, there is a relationship between the loss of the original language and births attended by midwives, herbal knowledge, and savings to the family economy.

2. Materials and Methods

Study area. This case study was conducted in the municipalities of the State of Mexico: Acambay, Atlacomulco, El Oro, Jiquipilco, Jocotitlán, Morelos, Temascalcingo, Timilpan, San Felipe del Progreso, San José del Rincón, and Villa Victoria, which are the main municipalities of origin of the students of the Intercultural University of the State of Mexico (UIEM) and their parents (Figure 1). These municipalities concentrate the largest population of the original Mazahua and Otomi indigenous group in the State of Mexico (INEGI 2020).

Figure 1. Places of origin of the families of students at the Intercultural University of the State of Mexico. Source: Own elaboration.
**Research Design**

A structured survey was designed, validated, and applied to UIEM students (with three sections: students, parents, and maternal and paternal grandparents). Quantitative (e.g., age, monthly income, perception of savings by midwife delivery, number of medicinal plants used in midwifery, number of people delivered by a midwife in the family, people in the family who practice midwifery, etc.) and qualitative (e.g., sex, ethnicity, original language or dialect of the student/parent/grandparents, common names of medicinal plants (MP) used in childbirth, common diseases due to childbirth, delivery by midwife, etc.) information was collected. The criteria were as follows: Inclusion: students of different study levels within the Intercultural Health degree program from the Mazahua and Otomi ethnic group, as well as from the non-ethnic group; adults belonging to the Mazahua and Otomi ethnic group, all from the aforementioned municipalities. Exclusion: students and adults from other ethnic groups, other states of the republic, and different municipalities. The consistency of the collected information was validated using Cronbach’s alpha and verified through field surveys (Tuapanta Dacto et al. 2017).

Field work. This was carried out in the months of February and March 2022 in the activities that the students of the Intercultural Health Division of Intercultural University of State of Mexico (UIEM) carry out in the community through community outreach. The research techniques used were participant observation, structured survey, and interviews. Observation was used to identify customs, plant uses, and the promotion of the practice of midwifery.

The sample size was calculated using Equation (1) for the maximum variance (Gil and Zarate Lara 2012) based on the population (enrollments) reported (563 students) by the UIEM. A total of 186 students (plus their parents and grandparents) were surveyed, representing 310% of the required sample size (n = 60).

$$n = \frac{NZ^2_{\alpha/2}pq}{Nd^2 + Z^2_{\alpha/2}pq}$$

Here, n: sample size; N: population size (N = 563); $Z^2_{\alpha/2}$: value of Z distribution tables $Z(Z^2_{\alpha/2} = 2.6896)$; p: proportion of the population with a binomial characteristic, $q = 1 - p$ (pq = 0.25); $d^2$: desired maximum absolute error (fixed as a fraction of p) (10%) ($d^2 = 0.01$).

The information obtained from the students was validated in the field in the main communities studied through an exploratory survey of adults from the Mazahua and Otomi indigenous group.

For the analysis of the correlation between the numbers of births attended by midwives with respect to generation (grandparents, parents, grandchildren), two functions were obtained: (a) one for those who belong to the original Mazahua and Otomi group and (b) one for those who do not identify with any original group. Both curves were superimposed in order to obtain, in percentage terms, the difference in births attended by midwives (DBM) (Equation (2)).

$$DBM = \int_a^b (f(g) - f(i))dx$$

Here, DBM is the difference in births attended by midwives; $f(g)$ is the community function for the Mazahua Otomi indigenous group; and $f(i)$ is the community function without any recognition of indigenous belonging.

**3. Results and Discussion**

The internal consistency of the instrument (survey) indicated reliability (alpha = 0.71). The students belonged to the municipalities of San Felipe del Progreso (29%), Atlacomulco (21%), Ixtlahuaca (15%), Jocotitlán (15%), and other municipalities (20% of the total). Seventy percent identify with or belong to some indigenous group (60% Mazahua, 9% Otomi, 1% other), while thirty percent consider that they do not belong to any indigenous group.
This membership and origin of the indigenous groups coincide with information from INEGI (2020). The latest population and housing survey reports that, in the State of Mexico, the municipalities of Atlacomulco, Ixtlahuaca, Jocotitlán, and San Felipe del Progreso are home to the largest Mazahua population and, as a second group, the Otomi. Both reside in the eastern part of the Valley of Mexico (Figure 1). This area is also considered to have a high level of marginalization. The analysis was enriched by comparing two groups, i.e., the 70% who identify with or belong to some native group (60% Mazahua, 9% Otomi, 1% other) and the 30% who consider that they do not belong to any indigenous group.

3.1. Native Language, Births Attended by Midwives along Three Generations (Grandparents, Parents, and Children), and Use of Medicinal Plants

The practice of midwifery-assisted births diminished progressively over the three generations (grandparents, parents, and children), both for the population that does not belong to any native group and for the Mazahua and Otomi indigenous group (Table 1). The latter reported a higher number of deliveries by midwife, with 23% more (DBM equal to the area between the two curves, see Equation (2) and Figure 2). The Mazahua and Otomi indigenous group and the community that does not belong to any group reported a decrease in deliveries by midwife of 25.5% and 22.8%, respectively, for the grandparents-to-grandchildren generation gap (Figure 2).

<table>
<thead>
<tr>
<th>Deliveries by Midwife (%)</th>
<th>Mother Tongue Speakers (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grandparents</td>
<td>Parents</td>
</tr>
<tr>
<td>Mazahua and Otomi indigenous group</td>
<td>62.5</td>
</tr>
<tr>
<td>Does not belong to any indigenous group</td>
<td>47.75</td>
</tr>
</tbody>
</table>

Source: Own elaboration.

Figure 2. Projection and ratio of the difference in births attended by midwives (or DBM) of people from the Mazahua/Otomi indigenous group and those who do not identify with any original group along different generations (grandparents–parents–children–grandchildren). Source: Own elaboration.

In this sense, this practice is not exclusive to the Mazahua and Otomi indigenous group; therefore, the community that does not belong to any native group also makes use...
of traditional medicine, which is understood as the sum of knowledge based on the beliefs and experiences of different cultures. Likewise, in this generational process, the Mazahua and Otomi indigenous group has lost 17% of its original language (Figure 3).

Regarding the loss of generational midwifery practice, the results coincide with several reports of midwifery in Mexico and the world in general (UNFPA 2012), with this exercise being even greater in indigenous communities (UNFPA 2012; Miranda 2021). There are several factors that explain this drop: (a) the professionalization of this practice in recent years, that is, the requirement to incorporate the practice of midwifery into a formal education system and thereby legally limit the practice of midwifery (Argüello-Avendaño and Mateo-González 2014; Bliss 2008); (b) the requirement that qualified personnel attend pregnant women, with the intention of reducing risks (of high-risk pregnancies and ensuring their care), posing it as a human right for women; and (c) the disqualification of midwives by conventional physicians (UNFPA 2012). These aspects are documented in the trenches of social anthropology and have permeated institutionalization through political, intellectual, and even religious power (Miranda 2021; Argüello-Avendaño and Mateo-González 2014). However, this research considers that this loss is multifactorial. In addition to the reasons mentioned above, the loss of the mother tongue also contributes. This aspect, inherent to the original peoples, serves as the primary medium through which knowledge and traditions are transmitted (Figure 3). Studies carried out in the Otomi community indicate that the customs and native languages are lost through grandparent, parent, and grandchild generations (Castillo 2015).

The present investigation reveals that births assisted by midwives in the Mazahua/Otomi indigenous group have decreased over the three generations with a rate of change of 25.52% from one generation to the next. Thus, it is expected that most of the children of the current generation will probably be born in a hospital or clinic (Figure 2). The data obtained from this research are relevant since there is a decrease in the registration of the practice of midwifery in the reports of international organizations (UNFPA 2012; Miranda 2021). When midwives are mentioned, it is generally implicit that it involves indigenous peoples. The possible disappearance of this practice entails the loss of knowledge on the use of medicinal plants of the Mazahua and Otomi indigenous group and an involution of their traditional millenarian medicine that took many years to integrate.
knowledge, skills, and abilities. This expertise is not only limited to the physical health of women but also attributed to mystical symbolism and the correct use of plants.

This study shows a decrease in the practice of midwifery and the loss of the native language. In both cases, traditional medicine is eroded. According to the projections (see Figures 2 and 3), there is a high probability that the children of Mazahua and Otomi students will not be born with the assistance of a midwife, and their grandchildren will not know the native language. In the study region, the decline in births attended by midwives is not limited to the Mazahua and Otomi indigenous group community; it is also observed in communities that do not belong to any specific group. However, more extensive studies should be conducted, such as random probabilistic sampling in different populations within the MO community and other ethnic groups. This research reveals a significant decrease in the MO community, with regards to being born with a midwife’s assistance and speaking the native language, at rates of 25% and 17%, respectively.

The 23% more deliveries by midwife across three generations in favor of the Mazahua and Otomi community compared to non-ethnic people (Figure 2) confirms that this native community predominantly practices traditional medicine and herbalism (Rodríguez-Zúñiga et al. 2023). According to the results, (a) only 11% of the MO indigenous group is unaware of medicinal plants used in midwifery, compared to 67% of those who do not identify with any ethnic group (non-indigenous). (b) In the Mazahua and Otomi community, there is a strong hereditary generational transition in herbal knowledge, particularly in comparison to the group that does not identify with any ethnic group. Women serve as the primary medium for this transition (85% of the interviewees were women). Both the students and their parents from the Mazahua and Otomi indigenous group are more knowledgeable about the variety of plants than are those who do not belong to any ethnic group. The difference was more significant between the Mazahua and Otomi parents and the students of no ethnic group (ten plants).

The disparity in the number of known plants according to age aligns with the findings of previous research (Guzmán-Mendoza et al. 2011; García and Mendoza 2017; Rodríguez-Zúñiga et al. 2023) conducted on indigenous students in Veracruz and the State of Mexico. These studies concluded that there exists a distinction between adults and young individuals in terms of their knowledge and application of local medicinal plants and their traditional use. Similarly, the transmission of herbal knowledge from parents to children occurs, with language serving as the primary medium. (c) A greater knowledge of two plants considered wild and with a strong tradition of use by the midwives of the Mazahua and Otomi community has been documented by several works (Ramírez 2008; Reyes-Carcaño et al. 2021; García and Mendoza 2017; Rodríguez-Zúñiga et al. 2023): “lengua de vaca” (Rumex crispus L.) and “too” (Montanoa tomentosa Cerv.). The latter is venerated and surrounded by symbolism in the process of pregnancy, childbirth, and puerperium among the Mazahua woman (Miranda 2021; Reyes-Carcaño et al. 2021).

In Mazahua communities, and in others with a deep indigenous identity, there is a strong learning process inherited by children from their parents, mainly in terms of knowledge and customs (García and Mendoza 2017). On the other hand, in this region of the State of Mexico, the Mazahua and Otomi are the most representative native groups, the ones who make the greatest use of medicinal plants and are the most marginalized in the area (INEGI 2020; Hernández et al. 2003). The five medicinal plants (MP) most used in midwifery, and which, in order of importance, were indicated by the respondents, are shown in Table 2. According to the results, (a) only two of them are wild flora of the region: the best known are “too” (9%) and “lengua de vaca” (5%); (b) of the five plants, chamomile is the most used by both groups, being more used by the community that does not identify with any group; and (c) the Mazahua and Otomi indigenous group has a greater knowledge of herbal medicine (at least in terms of uses for midwifery), since only 11% of the respondents mentioned not knowing about MP.
Table 2. Medicinal plants most used in midwifery by the Mazahua and Otomi indigenous group with respect to those not belonging to any native group.

<table>
<thead>
<tr>
<th>Common Name (Scientific Name)</th>
<th>Ethnicity</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mazahua/Otomi</td>
<td>Non-Indigenous</td>
</tr>
<tr>
<td>Chamomile (Matricaria recutita L.)</td>
<td>15</td>
<td>11</td>
</tr>
<tr>
<td>Rue (Ruta graveolens L.)</td>
<td>12</td>
<td>9</td>
</tr>
<tr>
<td>Too (Montanoa tomentosa Cerv.)</td>
<td>14</td>
<td>11</td>
</tr>
<tr>
<td>Lengua de vaca (Rumex crispus L.)</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Ginger (Zingiber officinale)</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>The use of plants is unknown</td>
<td>14</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>131</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Own elaboration.

The community that does not identify with any native group, which is represented by 80% of the world population, also uses traditional medicine (Tabuti et al. 2003). With this knowledge, they satisfy the needs in primary health care, above all, of those plants commonly used and known by the population. For this reason, in both groups, the following stand out as medicinal plants: chamomile, ginger, and rue. All of them are cited in the catalog (WHO 2002) on medicinal plants commonly used around the world (Tabuti et al. 2003).

3.2. Perception of Savings to the Family Economy Due to Midwife-Assisted Births

The social marginalization of the Mazahua and Otomi community means that, in the process of attending a woman’s birth, they prefer midwives for the economic savings (and perhaps for a humanized birth process in care during gestation, birth, and the postpartum period, and best nutrition through breastfeeding for longer periods) rather than for the lack of health centers in their communities (Ramírez 2008; INEGI 2020). This is because 79.3% consider that there are economic savings of between 25% and 75% if the delivery is assisted by a midwife (Table 3). Paradoxically, this condition could act as a force of tension and counterbalance the deterioration of the practice of midwifery and the benefits it brings. However, opting for a midwife over health centers and the impact of this choice on the family economy is a reason for future research considering this work.

Table 3. Perception of economic savings from the practice of midwifery by parents of students.

<table>
<thead>
<tr>
<th>Total Number of Respondents</th>
<th>Economic Savings</th>
<th>Average Monthly Household Income (MXN)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Between 25% and 50%</td>
<td>Between 50 and 75%</td>
</tr>
<tr>
<td></td>
<td>N (%)</td>
<td>N (%)</td>
</tr>
<tr>
<td>Mazahua/Otomi (126)</td>
<td>56</td>
<td>42.7</td>
</tr>
<tr>
<td>Not belonging to any group (54)</td>
<td>24</td>
<td>43.6</td>
</tr>
<tr>
<td></td>
<td>s.d. = 2500.00</td>
<td></td>
</tr>
</tbody>
</table>

s.d. = standard deviation. Source: Own elaboration.

Globally, the practice of midwifery is linked to poverty. According to UNFPA (2012), in developed countries, 98% of births are attended by conventional doctors, but in low-income countries, the percentage drops to 65%, and particularly in poorer countries, only 20% are attended.

Midwives in the MO indigenous group represent a significant human resource for the family economy in a highly marginalized area. The minimum monthly income (in July 2019 Mexican pesos) for a rural community ranged between MXN 2700.00 (USD 145.90) and MXN 6799.00 (USD 367.43) (CONASAMI 2021). It is important to note that the study area is considered a zone with high marginalization (INEGI 2020); this coincides with
the average monthly income of parents in the Mazahua and Otomi indigenous group amounting to MXN 5,238.00 (standard deviation = MXN 2,959.00), which is almost 46% of the wage considered to be below the poverty line (MXN 11,290.80) (CONEVAL 2017).

Authors such as Rodríguez-Zúñiga et al. (2019) and Rodríguez-Zúñiga et al. (2023) have documented the significance of forest resources (FR) (medicinal plants are non-timber resources) and medicinal plants in family economic savings in rural communities, which fluctuates for FR between 10 and 35 percent and for medicinal plants between 10% and 50%. The Mazahua community (the most representative of the area) has a great tradition in the knowledge and use of MP (INEGI 2020; García and Mendoza 2017). People who identify with certain groups are more inclined to save money using medicinal plants, and rural communities in Mexico exhibit a higher utilization of medicinal plants in primary healthcare (WHO 2007). Regarding the economic impact of midwife-assisted births, this study is the sole assessment in this domain. Accordingly, it is advisable to conduct cost–benefit analyses of childbirth and its inherent advantages (such as humane childbirth, extended lactation nutrition, and gains from midwifery practice) in both the MO community and non-ethnic groups. Nevertheless, this research serves as a reference for understanding the economic savings attributed to this practice.

Preserving the practices of midwifery and the native languages of the Mazahua and Otomi community holds significant importance. Within this practice lies a wealth of knowledge concerning herbalism and traditional medicine that contributes to the diverse cultural landscape of Mexico. Acknowledging the efforts of midwives and providing them with proper training is vital in averting childbirth-related fatalities within impoverished communities across the nation (UNFPA 2012). This demographic encompasses 87% of the total care provided for essential sexual, reproductive, maternal, and neonatal health services. Furthermore, both professional and traditional midwives play a critical role in responding to emergent events like the COVID-19 pandemic (UNFPA 2012). However, due to their marginalized and impoverished status, traditional midwives face disadvantages when compared to their professional counterparts.

This research contributes to ethnobotanical knowledge and provides a basis for future studies on the conservation and management of Mazahua and Otomi flora. Considering the clear decline in the native language within the Mazahua and Otomi community, it becomes imperative to assess how they perceive the attributes of their medicinal plants and traditional medicine. This evaluation can be achieved through phytochemical, pharmacological, and ethnobotanical studies. Simultaneously, these studies introduce certain advantages associated with midwifery practice and underscore the potential repercussions of its erosion.

It is crucial to emphasize the nearly proportional correlation between the loss of the native language and the decline in midwife-assisted births. This observation underscores the significance of the native language as a foundational component of the knowledge systems that interconnect these original peoples with their land and play a pivotal role in their survival (UNESCO https://es.unesco.org/courier/2019-1/lenguas-indigenas-conocimientos-y-esperanza (accessed on 19 June 2023)). Ethnobotanical knowledge among these indigenous communities is enshrined in their way of describing and comprehending nature. As the language vanishes, an array of environmental, technological (such as traditional methods of collecting and processing medicinal plant infusions), social, economic, and cultural insights amassed by its speakers over generations also disappears.

In this light, it is crucial to delve into more comprehensive studies on the forms and applications of medicinal plants and herbal medicine, particularly in the realm of midwifery. Such investigations could have significant contributions to the medical field. For instance, tea made from the “too” plant, with its similarity to oxytocin and its utilization by nurse-midwives and midwives to facilitate uterine contractions during childbirth, exemplifies this potential (Miranda 2021).

Lastly, it is advisable to expand this study through a random probability sample that compares two populations from the study municipalities: those who do not identify with
any indigenous group and those who belong to the Mazahua and Otomi group. This step, addressing a limitation of the current research, could provide more comprehensive insights. Similarly, within the Mazahua and Otomi indigenous group, a more in-depth examination is recommended for various aspects, including the economic impact of midwifery practices (another limitation of this study, which only examined perceptions of savings to the family economy). This evaluation should consider factors like the budget line in the income of the rural population under study. Additionally, it would be insightful to break down, both quantitatively and qualitatively, the contribution of midwifery to other components of traditional medicine, such as “yerberos” (witch doctors) and “huéseros” (bonesetters). Investigating the relationship between these local groups and the plant kingdom, and how it shapes their cultural development, is also an area worth exploring.

4. Conclusions

In the Mazahua and Otomi indigenous group, there is a correspondence between the loss of the native language and births attended by midwives along three generations (grandparents–parents–children). Across these generational ages, the language is lost at a rate of 17.05%, and the births attended by midwives decrease at a rate of 25.5%. If this trend continues, there is a high probability that the children of this generation (Mazahua and Otomi students) will be born in a hospital or clinic and that their grandchildren will lose their native language at the same rate.

Twenty-three percent more births were assisted by midwives in the Mazahua and Otomi indigenous group in comparison to the community that does not identify itself as part of a native group. Within this surplus lies ancestral wisdom. Both groups exhibit a substantial contrast in terms of familiarity with medicinal plants used in midwifery, favoring the Mazahua and Otomi group. The two main wild plants used by Mazahua and Otomi midwives are “too” (*Montanoa tomentosa* Cerv.) and “Lengua de vaca” (*Rumex crispus* L.).

Within the Mazahua and Otomi community in the study region, the decline of the original language and the practice of midwife-assisted births—reducing at rates of 17.05% and 25.5%, respectively—raises a significant likelihood that forthcoming generations (children and grandchildren) will lose a portion of their understanding of herbal medicine and traditional healing practices. The native language serves as the primary conduit for transmitting the knowledge and cultural heritage of the native peoples.

According to the perceptions of individuals within the Mazahua and Otomi indigenous group, a significant majority, 79.3%, believe that being attended by a midwife results in economic savings ranging between 25% and 75%. This observation holds significance due to the fact that the average monthly income per family within this community amounts to nearly 46% of the income threshold designated as below the poverty line.

The loss of the native language and the practice of midwifery in the Mazahua and Otomi indigenous group have led to the aridity of the culture of these native peoples. With this, knowledge and traditions that took hundreds of years to acquire are lost, impoverishing cultural diversity and the heritage of traditional Mexican medicine.

This research furnishes pertinent quantitative data that could underpin future studies aiming to bolster public policies within a suitable social framework. These policies could effectively promote, regulate, and safeguard the practices of midwifery, the preservation of native languages, and the traditions of the Mazahua and Otomi indigenous group related to traditional medicine. Promoting and protecting traditional midwifery retains this accumulation of knowledge of the native Mazahua and Otomi indigenous group that contributes to Western medicine (obstetrics, perinatology, and neonatology), traditional herbal medicine, nutrition for long periods of breastfeeding, and humanized childbirth. Likewise, the role of midwives is valued for their participation in the care of indigenous and non-indigenous women who are limited by their poverty. In conclusion, a recommendation is put forth for the Intercultural University of the State of Mexico and other intercultural universities to include traditional midwifery within their health science study programs.

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