Original Research Article

Use of medicinal plants in the alternative treatment of breast cancer

ABSTRACT

Breast cancer is the second most frequent type of cancer in the world and the most common among women and its incidence has been increasing over time. From the 70s of the last century, the use of alternative therapies became popular, with their adherence increasing annually, starting to be used by various groups, including cancer patients. Plants are one of the oldest forms that the population of various regions and cultures in the world uses as a palliative method and with a medicinal purpose for the treatment of various diseases, including cancer. The objective of this study was to identify the use of medicinal plants in the alternative treatment of breast cancer. The survey data were collected from February to March 2022, using a semi-structured questionnaire. The participation of women in the research stood out that of men. The age group of 31 to 40 years stood out from the others, the use of medicinal plants is common in 66.7% of the interviewees. About breast cancer, 31.5% reported that there are cases in the family, which are treated with radiotherapy, chemotherapy, surgery and allopathic medication. 85.2% who believe in treatment with the use of medicinal plants, the most cited plants were lemon balm, lemongrass and mint, chamomile, boldo and aloe, these are generally used by respondents. *Aloe vera*, soursop, basil and noni were cited as plants used to treat breast cancer. The leaves are the main part used by the interviewees, and the main form of use was infusion/tea, mentioned 45 times by the participants. After starting to use the plants, 85.7% stated that their symptoms had improved. As for the origin of knowledge about the use of medicinal plants, most claimed to have learned from their parents and grandparents. Medicinal herbs are mainly purchased at markets/fairs. For 61.1% of participants, medicinal plants do not pose health risks.

Keywords: Medicinal Herbs; Health; Treatment; Popular Use.

1. INTRODUCTION

According to the World Health Organization (WHO), cancer should be considered a public health problem, especially among developing countries, given that in the coming decades, the impact of this disease on the population will correspond to 80% of more than 20 million new cases estimated for 2025 in the world population (STEWART; WILD, 2014). Data published by the José Alencar Gomes da Silva National Cancer Institute (INCA) in 2015 revealed that the most frequent types of cancer in the world were lung (1.8 million), breast (1.7 million), intestine (1. .4 million) and prostate (1.1 million). In women, the most detected were breast (25.2%), intestine (9.2%), lung (8.7%), cervix (7.9%) and stomach (4.8%) (AMORIM et al., 2021).

Cancer treatment is quite complex because it is a multifactorial disease that requires multiple interventions, whether medical, nutritional or related to changes in lifestyle. Furthermore, its association with mental, emotional, social and even spiritual problems is attributed. The therapeutic modalities currently available for the treatment of breast neoplasms are surgery, radiotherapy, chemotherapy and hormone therapy. And as an auxiliary treatment is the use

of medicinal plants (DELL'ANTONIO et al., 2016). This use is not always related to the cancer itself, but to correlated symptoms, such as pain and inflammation, nausea, vomiting or even increased oxidative stress (RAGHAVENDRAN et al., 2011).

For economically disadvantaged populations, there is not always access to health services and industrialized medicines. As a consequence, the search for medicinal plants becomes natural, often easily obtainable and seen as safe and beneficial (SANTANA et al., 2014). Therefore, the use of plants for medicinal purposes is too old and has lasted throughout human history, especially among the elderly, since the use of plants among families is directly related to the knowledge transmitted between generations, or for cultural reasons (SILVA et al., 2017).

In this perspective, the study of plants for therapeutic purposes is part of an ecological and social context, being of great relevance for the population that suffers from social and economic pressures, portraying an alternative to treatments with synthetic medicines (MARTINS; GARLET, 2016). Therefore, investigating popular knowledge is the initial step towards the scientific discovery of new plants with therapeutic activities, since several diseases can be treated or alleviated through preparations of plant origin and many drugs available on the market come from plant sources, in addition, this information collaborates with the safety in the use of medicines extracted from plants (COSTA et al., 2010; PIO et al., 2018).

Given this context and motivated by the personal experience lived in Timor-Leste, where a family member (mother) was cured of breast cancer during treatment with a medicinal plant (not yet botanically identified), the idea of investigating the use of medicinal plants in the alternative treatment of breast cancer, which will be considered a public health problem in the world. Therefore, considering the above, the objective of this study was to identify the use of medicinal plants in the alternative treatment of breast cancer.

2. MATERIAL AND METHODS

2.1. Data collection and analysis

The survey data were collected from February to March 2022. For this purpose, a semi-structured questionnaire (Appendix 1) was used, which contained 23 questions about the socioeconomic profile, whether the respondent had already used plants for the treatment of breast cancer. Breast in the family, which plants they used, frequency of use, mode of use, results obtained, among other issues related to the subject of the study.

The research was of the descriptive-exploratory type, this is justified, because the medicinal plants used in the alternative treatment of breast cancer were investigated without the interference of the researcher. It was carried out through the Google Forms digital platform and sent through a link to the questionnaire by messaging applications, which was shared in groups related to academic subjects inside and outside the university, using the methodology described by Albuquerque, Lucena and Cunha (2010).To present the results, the data obtained were entered into Excel spreadsheets, and then transformed into graphs with the percentages according to the research variables.

2.2. Ethical procedures

The questionnaire link was sent and accompanied by an explanatory text, identifying the purpose of the research. A Term of Free and Informed Consent (TCLE) adapted to the online platform was also inserted, for the due authorization of the interviewees' testimonies.

Although no physiological or psychological changes were made to the participants, the research presented minimal risks such as embarrassment in answering personal questions. Risks were minimized and questions were thoroughly reviewed, in addition to explaining the objectives, rationale and benefits of this study to participants. As benefits provided by the present research, the contribution to future research was evidenced. Participants were assured of anonymity when publishing the results, as well as confidentiality of confidential data.

3. RESULTS AND DISCUSSION

54 respondents answered the survey, in which it was identified that 62% of these were female and 38% male, therefore, the participation of women stood out that of men. As for the age range, it was found that the 31 to 40 year old stood out from the others. Unlike this study, the predominant age group among participants in the work developed by Silva, Rocha and Pereira (2020) was 51 to 80 years old, probably due to the knowledge acquired over time.

There was a predominance of answers obtained by participants from the urban area (75.9%) to the detriment of the rural area (24.1%). As for the level of education, Nobre (2015) infers that the level of education of a population can influence common practices of use and knowledge of medicinal plants, even if these methods are closely linked to popular tradition. In this survey, 59.3% of respondents declared having completed higher education, followed by 24.1% with incomplete higher education, 14.8% have completed secondary education and 1.8% incomplete primary education.

Chronic illnesses are not medical emergencies that require immediate attention. However, they can be quite serious and need care over many years or even a lifetime. When asked if they had any type of chronic disease, 77.8% said they did not have it and 22.2% had some type of chronic disease, among which diabetes, hypertension, bronchitis, lupus and chronic sinusitis stood out. Regarding the use of synthetic medication for continuous use, 68.5% do not use it, 18.5% use it continuously, and 13% claim to use it only sporadically. Regarding the difficulties in acquiring the medication, 88.9% reported not having it and only 11.1% had problems obtaining it, mainly due to the high cost of the medication.

Asked if the use of medicinal plants is common in the family, 66.7% answered yes, 25.9% no and 7.4% reported using them sometimes. In research carried out by Santos et al. (2019), participants stated that they used plants to cure their illnesses. The main use of medicinal plants is that done in combination: treatment, cure and disease prevention (51.9%).

Breast cancer is the second most frequent type of cancer in the world and the most common among women and its incidence has been increasing over time. Brazil has followed the high incidence and mortality rates of breast cancer in developed countries, representing today a serious public health problem (INUMARU; SILVEIRA; NAVES, 2011). Given this scenario, respondents were asked whether there is a history of breast cancer in the family, and if so, what treatment was adopted. Fortunately, 68.5% said they had no family records, however, 31.5% reported that they did. Among the treatments adopted, radiotherapy, chemotherapy, surgery and allopathic medication stand out. In a study developed by Nascimento, Machado

and Aragão (2019), the conventional therapeutic modalities used were chemotherapy in 60.56%, radiotherapy in 30.99% and surgery in 8.45% of cases.

About alternative treatments for breast cancer, the research participants were asked if they believe in the treatment using medicinal plants, 85.2% said they believe and 14.8% do not. Regarding the treatment of cancer, there are studies that affirm the existence of some species of plants, which have activities on malignant tumors. In Brazil, there are few studies involving herbal medicines within the scope of oncological studies and there are still insufficient studies on this topic in the population with breast carcinoma (CARDOSO; AMARAL, 2019).

A variety of medicinal plants were cited by the participants for the treatment of diseases in general, a total of 136 citations, as can be seen in Table 1. The most cited in number of citations (NC) were lemon balm (16 CN), lemongrass saint and mint (11 CN), chamomile (10 CN), boldo (8 CN) and *Aloe vera* (7 CN). In a phytochemical study conducted by Roriz et al. (2014), the antioxidant compounds of lemongrass were evaluated, and it was found that it had the ability to remove superoxide anion and hydroxyl radical, revealing that these compounds have a protective effect against reactive species that are involved in diseasesinflammatory and degenerative. For Oliveira and Santos (2021), the aroma coming from the leaves is the result of an essential oil known as lemongrass essence. This oil is mainly composed of citral, a substance that guarantees the plant its calming and spasmolytic action.

Table 1. Medicinal plants mentioned for the general treatment of diseases.

Popular name	Scientific name	Botanical family	Citation number
Turmeric	*Cúrcuma longa* L.	Zingiberaceae	2
Rosemary	*Salvia rosmarinus*	Lamiaceae	3
Basil	*Ocimumbassilicum*	Lamiaceae	4
Caboclo lavender	*Hyssopusofficinalis*	Lamiaceae	1
Cotton	*Gossypiumherbaceum* L	Malvaceae	2
Garlic	*Allium saticum* L.	Amaryllidaceae	1
Aloe vera	*Aloe vera*	Xanthorroeaceae	7
Angico	*Anadenantheracolubrina*	Fabaceae	1
Aranto/Mother of thousands	*Kalanchoedaigremontiana*	Crassulaceae	1
Mastic	*Schinusterebinthifolia*	Anacardiaceae	4
Balm	*Cotyledon orbiculata*	Crassulaceae	1
Barbatimão	*Stryphnodendron*	Fabaceae	2
Betel/pepper tree	*Piper betle*	Piperaceae	1
Bilberry	*Peumusboldus*	Monimiaceae	8
Chamomile	*Matricariachamomilla*	Asteraceae	10
Cannabis	*Cannabis sativa*	Canabaceae	1
Indian cane/banana tree	*Canna indica*	Cannaceae	1
Cinnamon	*Cinnamomumverum*	Lauraceae	4

Holy grass	*Cymbopogoncitratus*	Gramíneas	11
Black tea/Camellia sinensis	*Camellia sinensis*	Theaceae	1
lemon balm	*Melissa officinalis*	Lamiaceae	16
Coco catole	*Syagruscearensis*	Arecaceae	1
Copaiba	*Copaiferalangsdorffii*	Fabaceae	1
Clove	*Syzygiumaromaticum*	Myrtaceae	1
Cupre	*Cupressussempervirens*	cupressaceae	1
Fennel / green anise	*Pimpinellaanisum*	Apiaceae	4
Spinach	*Spinaciaoleracea*	Amaranthaceae	1
Espinheira-santa	*Maytenusilicifolia*	Celastracea	2
Eucalyptus	*Eucalyptus globulus*	Myrtaceae	1
Ginger	*Zingibreofficinale*	Zingiberaceae	3
Guajiru	*Chrysobalanusicaco* L.	Chrysobalanaceaes	1
Mint	*Mentha x piperita* L	Lamiaceae	11
Orange	*Citrus sinensis*	Rutaceas	1
Laurel/laurel	*Lourusnobilis*	Lauraceae	1
Mastruz	*Dysphaniaambrosioides*	Amaranthaceae	2
Melaleuca	*Melaleucaalternifólia*	Myrtaceaa	1
Melon-of-Saint-Caetano	*Momordicaindica* L	Cucurbitaceae	1
Noni	*Morindacitrifolia*	Rubiaceae	3
Oregano	*Origanumvulgare*	Lamiaceae	2
Stone break	*Phyllanthusniruri*	Phyllanthaceae	1
Quixaba/quixabeira	*Sideroxylonobtusifolium*	Sapotaceae	1
Pomegranate	*Punicagranatum*	Lythraceae	3
Elderberry	*Sambucusnigra*	Adoxaceae	4
Skirt	*Kalanchoebrasiliensis*	Crassulaceae	2
Sage	*Salvia officinalis*	Lamiaceae	1
Sucupira	*Pterodonemarginatus*	Fabaceae	1
Plantain	*Plantago major*	Plantaginaceae	3
Total			**136**

Studies have shown that lemongrass, empirically widely used by the Brazilian population, has scientifically proven antibacterial (Lucena et al., 2015) and calming (Peixoto et al., 2015) effects. The popular use of herbal medicine to treat abdominal cramps, fever, abdominal pain and hypertension is very frequent and with satisfactory results (NUNES; BERNARDINO; MARTINS, 2015; NETO, 2015). According to Ribeiro et al. (2014), the use of mint is indicated for fever, high cholesterol, weakness, flu, headache, sore throat, stroke, thrombosis, stroke, heart problems, branch in the eye, soothing, poor digestion and

menstrual colic and boldo is indicated in the treatment of labyrinthitis, pain in the stomach, pain in general, flu, poor digestion, pain in the belly, infection in the intestine and pain in the liver, and chamomile is indicated for headaches and nerves.

Table 2 contains the list of medicinal plants cited specifically for the treatment of breast cancer.

Popular name	Scientific name	Botanical family	Citation number
Aloe vera	*Aloe vera*	Xanthorroeaceae	1
Soursop	*Annonamuricata*	Annonaceae	1
Basil	*Ocimumbassilicum*	Lamiaceae	1
Noni	*Morindacitrifolia*	Rubiaceae	2

In research with *Aloe vera* conducted by Ozsoy, Candoken and Akev (2009) antiseptic action (saponin and anthraquinone) were identified; antitumor (mucopolysaccharides), anti-inflammatory (steroids and salicylic acid), antioxidant (vitamins), immunoregulatory and detoxifying action (glucomannans). According to results obtained in a study developed by Toliopoulos et al. (2012), *A. vera* was able to improve the immune system, increasing the cytotoxicity of natural killer cells in the fight against cancer cells in in vitro research, this same study demonstrated that *A.vera* also increased the cytotoxicity of natural killer cells in blood samples of volunteers who ingested the juice for 45 days.

For soursop (*Annonamuricata*) activities were identified: antiviral, antiparasitic, astringent, antirheumatic and antileishmania and antitumor (SILVA; NEPOMUCENO, 2011). Noni (*Morindacitrifolia*) is a stimulant of the immune system (Matoso et al., 2013); useful in burns, wounds, tumors, indigestion and menstrual irregularities (Palioto et al., 2015); it has antibacterial, antiviral, antifungal, antitumor, anthelmintic, analgesic, anti-inflammatory, hypotensive and immune activity and stimulating antineoplastic action (PALIOTO et al., 2015).

The leaf is the main part used by respondents (46 citations), followed by roots (26), bark (24), fruits (13) and seeds (12). Brito, Marín and Cruz (2017) explain that the leaves of medicinal plants are used more than all other parts of the plant, due to the ease of collection. The authors point out that most of the active principles is concentrated in the leaves. It is important to emphasize that most of the plants used to treat diseases are herbaceous, with leaves throughout the year and, therefore, easy to acquire them (FREITAS et al., 2015).

For Bortoluzzi, Schmitt and Mazur (2020), the effect of a medicinal plant is determined by the way in which the species is used, from its dosage and preparation. The main form of use cited by respondents was infusion/tea, cited 45 times, followed by syrup (22), decoction/cooking (16), inhalation (13), plant extract (12), compress (8), maceration and cream/ointment (7).

According to Lima et al. (2013) it is necessary to pay attention to the frequency of use and the way of handling medicinal plants, because although natural, every plant has active principles that can cause poisoning and complications in the body, if used improperly or for a long period. of time. For the study participants, the use of medicinal plants is done mostly weekly (48%), rarely (30%), monthly (12%) and fortnightly (10%).

When asked about the results after they started using medicinal plants, 85.7% said they had improved their symptoms, 12.2% noticed other benefits and 2.1% did not notice any improvement in their condition. In research carried out by Campos, Correia and Marisco (2020), most of the interviewees observed more efficiency in medicines based on medicinal plants than synthetic ones. It should be noted that it is necessary to pay attention to these

results, since Brazil has enormous plant diversity, and most of these plants have an unknown potential and the discovery of new herbal medicines can generate innovative products and provide benefits in communities, because they are cheaper than synthetic drugs.

Asked if they inform the doctor about the use of medicinal plants, the majority (38%) said yes, 32% of respondents only inform sometimes and 30% do not inform. Ferreira and Godoy (2016) explain that this is related to the permanence of popular belief, in which most people associate the use of natural products with the non-occurrence of side effects. According to Feijó et al. (2012) it is necessary to encourage scientific studies that prove the existing popular knowledge about plants and their effectiveness in treating diseases, thus avoiding the harm resulting from misuse, providing increased benefits in the use of medicinal plants.

Traditional knowledge is essential, since knowledge about the empirical use of plants is in danger of disappearing (BALESTRIN et al., 2020). As for the origin of knowledge about the use of medicinal plants, most claimed to have learned from their parents (37 NC), followed by grandparents (35), internet (16), neighbors (13), books (12) and school (10) quotes, respectively. Similar results were obtained in a study by Neri et al. (2018), in which parents and grandparents are primarily responsible for teaching about the use of medicinal plants to treat illnesses. The maintenance of popular wisdom about the use of medicinal plants requires the involvement and interest of new generations.

The plants mentioned above are purchased at markets/fairs (33 NC), cultivation (28 NC) and from neighbors (20). Due to the fact that treatment with medicinal plants has a low cost and is easily found or acquired, it arouses the population's interest in herbal treatments, making this habit constant, mainly by the poorest public, who often do not have satisfactory access to modern medicine (NERI et al., 2018). Regarding the simultaneous use of medicinal plants with synthetic medicines, 64.7% believe that there may be some effect on the synthetic medicine, while 35.3% said no. Thus, for 61.1% of the participants who answered the questionnaire, medicinal plants do not pose health risks, while 38.9% reported that there may be risks. This result corroborates those of Oliveira and Dantas (2012), as it was demonstrated that there is confidence and great significance in relation to the use of homemade preparations for the treatment of illnesses, and that many relatives resort to treatment with medicinal plants even before seek medical help.

4. CONCLUSION

The participation of women in the research stood out that of men. The age group of 31 to 40 years stood out from the others, the use of medicinal plants is common in 66.7% of the interviewees. About breast cancer, 31.5% reported that there are cases in the family, which are treated with radiotherapy, chemotherapy, surgery and allopathic medication. 85.2% who believe in treatment with the use of medicinal plants, the most cited plants were lemon balm, lemongrass and mint, chamomile, boldo and aloe, these are generally used by respondents.

Aloe vera, soursop, basil and noni were cited as plants used to treat breast cancer. The leaves are the main part used by the interviewees, and the main form of use was infusion/tea, mentioned 45 times by the participants. After starting to use the plants, 85.7% stated that their symptoms had improved.

As for the origin of knowledge about the use of medicinal plants, most claimed to have learned from their parents and grandparents. The use of plants is part of the culture of the Brazilian people and is based on family tradition. Medicinal herbs are mainly purchased at markets/fairs. For 61.1% of participants, medicinal plants do not pose health risks.

Knowing and valuing the popular knowledge of the use of medicinal plants is very important. However, just the traditional popular use is not enough to validate them as effective and safe drugs, so it is also important to know how to use them correctly. For this, it is necessary to observe the scientific information of each plant and not just stick to empirical knowledge.

Regarding the treatment of cancer, there are studies that affirm the existence of some species of plants, which have activities on malignant tumors. It is recommended to consult a pharmacist or a doctor or someone knowledgeable in the field about the proper use of the plant. The correct knowledge of the benefits and effects of a plant to handle them properly is essential for users.

CONSENT

All authors declare that 'written informed consent was obtained from the patient (or other approved parties) for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editorial office/Chief Editor/Editorial Board members of this journal.

ETHICAL APPROVAL

All authors hereby declare that all experiments have been examined and approved by the appropriate ethics committee and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

NOTE:

The study highlights the efficacy of "HERBAL" which is an ancient tradition, used in some parts of India. This ancient concept should be carefully evaluated in the light of modern medical science and can be utilized partially if found suitable.

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APPENDIX

QUIZ

Bachelor's Degree in Agroecology

State University of Paraiba

Campus II

Graduating: Quintão Amaral

Guidance teacher: Semirames do Nascimento Silva

Course completion work: Use of medicinal plants in the alternative treatment of breast cancer.

Research objective: To identify the use of medicinal plants in the alternative treatment of breast cancer.

I declare that i was duly informed about the general objective of this research, which is to identify the use of medicinal plants in the alternative treatment of breast cancer. I was informed that i will answer a questionnaire with (23) questions. I am aware that all information answered by me is confidential and will be kept confidential, being used only for the purposes of this study, without personal identification.

There are minimal risks when participating in the study, and if i feel uncomfortable answering any question in the questionnaire, i can abandon the form, not answer any question, leaving it blank or sending the questionnaire blank without any prejudice. I was also informed that, as it is an online survey, it is not exempt from technical failures resulting from this type of data collection (system problems, temporary unavailability of the page, loss of information). The benefits of participating in the research are the results incorporated into scientific knowledge, and subsequently into teaching-learning situations.

My participation is voluntary and i can discontinue it at any time. I will not have to pay any amount to answer the questions, nor will i receive any amount for answering. Any questions i have about this research can be answered by the researchers of this study.

1. Sex
2. Resides
3. Age group
4. Schooling
5. Do you have a chronic illness? If yes, which one?
6. Do you use synthetic medication for continuous use?
7. Do you find it difficult to purchase medication? If yes, which one?
8. Is the use of medicinal plants common in your family?
9. What is the purpose of using medicinal plants?
10. Do you know breast cancer?
11. Is there a family history of breast cancer? If so, what treatment was adopted?
12. Do you believe in treating breast cancer using medicinal plants?

13. What medicinal plants do you use?
14. Among these plants, do you use any to “treat” cancer?
15. What part of the plant is used?
16. How are medicinal plants used?
17. How often are plants used?
18. Did you notice any improvement after you started using medicinal plants?
19. When you use a medicinal plant, do you inform the doctor?
20. From whom did you learn to use medicinal plants?
21. Where do you buy the plants?
22. Can the use of medicinal plants cause any effect when used simultaneously with synthetic drugs?
23. Do medicinal plants pose health risks?
the scientific community in building knowledge about the popular use of medicinal plants that can help in the treatment of cancer.