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Nongthombam Debjani
HOD, Department of OBG, Dhanwantari Nursing College Affiliated to INC, RGUHS and KNC, Bangalore, Karnataka, India

Corresponding Author:
Nongthombam Debjani
HOD, Department of OBG, Dhanwantari Nursing College Affiliated to INC, RGUHS and KNC, Bangalore, Karnataka, India

A study to evaluate the effectiveness of hot application in reduction of back pain among menopausal women in selected community, Bangalore

Nongthombam Debjani

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Abstract
Background: Menopausal back pain is the most common public health problem throughout the world with high lifetime prevalence of back pain is 60% - 80% and India is among the countries worst affected. Application of hot water relieves menopausal back pain with the features like inexpensive and easy to use which is appropriate in community setting.
Objectives of the study
1) To assess the level of back pain before hot application among menopausal women in experimental and control groups.
2) To assess the level of back pain after hot application among menopausal women in experimental and control groups.
3) To evaluate the effectiveness of hot application in reduction of back pain among menopausal women in experimental and control groups.
4) To compare the level of back pain among menopausal women in the experimental and control groups.
5) To find out the association between the levels of back pain and selected variables of menopausal women in the experimental and control groups.
Methods: A true experimental pre-test and post-test design was adopted to evaluate the effectiveness of hot water bag application in reduction of menopausal back pain. The samples were selected by random sampling technique. Pre-test was conducted on first day followed by hot water application for about 10-20 minutes daily once for 3 days. Post-test was done on the fifth day. Data were collected with the help of interview method using investigator developed pain assessment scale. The data reliability was 0.941 and validity of tool was ensured before proceeding with data collection.
Result: In the pre-test experimental group, 15 (42.857%) menopausal women had moderate back pain and 20 (57.143%) menopausal women had severe back pain. And in the pre-test control group, 12 (34.286%) had moderate back pain and 23 (65.714%) had severe back pain. However, in the post-test, for experimental group, 24 (68.57%) had mild back-pain, and only 11 (31.43%) had moderate back-pain and none had severe back pain whereas for control group, 12 (34.29%) had moderate back-pain and 23 (65.71%) had severe back pain. The hot water bag application was found to be effective in the reduction of menopausal back pain at $p<0.001$ level of significance for 34 degrees of freedom, since within group comparison by paired 't' test showed a 't' value of 33.297 for experimental group which is greater than the table value, 3.646 at $p<0.001$ level for 34df. Comparison between pain levels of experimental and control groups by student 't' test (unpaired 't' test) shown significance as the calculated 't' value of 19.438 in the post-test is greater than the table value at $p<0.001$ level for 68df. Significant association was obtained between pre-test level of back pain and age, occupation and duration of back-pain, similarly between post-test level of back-pain and age, duration of back-pain and dietary pattern in the experimental group. The level of significance was set at 5%.
Interpretation and Conclusion: Thus, the above result reveals that there is reduction of menopausal back-pain after hot water bag application in experimental group but no reduction of back-pain in the control group.

Keywords: Menopause, menopausal women, back-pain and hot application

Introduction
Menopausal back pain is the most common public health problem throughout the world with high lifetime prevalence of back pain is 60% - 80% and India is among the countries worst affected. Application of hot water relieves menopausal back pain with the features like inexpensive and easy to use which is appropriate in community setting.

Need for study

Low back pain is a growing public health problem throughout the world and the lifetime prevalence of back pain is 60% to 80%. India is among the countries worst affected with as many as 30 million women suffering from back pain. In Bangalore, the menopausal back pain is highest in women in the age group of 50 to 70 years. Using a hot water bottle has many uses and is very easy to use. Topical heat therapy has demonstrated superior pain relief, improved muscle flexibility and decreased disability when compared with both acetaminophen and ibuprofen in the treatment of back pain. The investigator recognized that, giving hot application to reduce back pain is not complicated and be done at home just by using hot water bag with hot water as it is inexpensive and easy method. Therefore researcher felt the need to study the effectiveness of hot application in reduction of back pain among menopausal women.

Objectives of the study

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3) To evaluate the effectiveness of hot application in reduction of back pain among menopausal women in experimental and control groups.
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5) To find out the association between the levels of back pain and selected variables of menopausal women in the experimental and control groups.

Assumption

- It is assumed that menopausal women may have different level of back pain.
- It is assumed that hot application will reduce the level of back pain among menopausal women.

Hypotheses

- **H_1:** There is a significant reduction in back pain after hot application than before among menopausal women in the experimental group.
- **H_2:** There is a significant reduction of back pain among menopausal women in experimental group than in the control group.
- **H_3:** There is a significant association between the level of back pain and selected variables among menopausal women in experimental group.
- **H_4:** There is a significant association between the level of back pain and selected variables of menopausal women in the control group.

Conceptual frame work

Conceptual frame work adopted for this study is based on Wiedenbach's 'The helping art of clinical nursing' (1964). Ernestine Wiedenbach's Theory consists of the Following Factors:

Central purpose: In this study the central purpose is to evaluate the effectiveness of hot application in reduction of back pain among menopausal women.

Prescription: In this study, the researcher administers hot water application for pain on the back site among menopausal women.

Realities: It involves five realities identified by Wiedenbach are agent, recipient, goal, means and framework

Agent: In this study the agent is the nurse researcher, who is professionally accountable to provide nursing care.

Recipient: In this study the recipients are the menopausal women with moderate to severe back pain.

Goal: In this study, the goal is to evaluate the effectiveness of hot application in reduction of back pain among menopausal women.

Framework: The framework in the study is the setting in which the study has been conducted that is at Biraweshwar Nagar and Lavakusha Nagar, Bangalore.

Means: The devices and activities used by the nurse to achieve the goal. It includes phases for achieving the goal like identification, ministration and validation in the study:

Identification: It involves viewing the patient as an individual with unique experience and identifying the needs. In this study the researcher identified menopausal women as an individual suffering from back pain.

Ministration: It refers to a provision of needed help. In this study it refers to the administration of hot water bag application for menopausal back pain.

Validation

It refers to the collection of evidence that shows that the patient reduces their back pain. In this study, the post test will evaluate the effectiveness of hot water bag application for back pain.

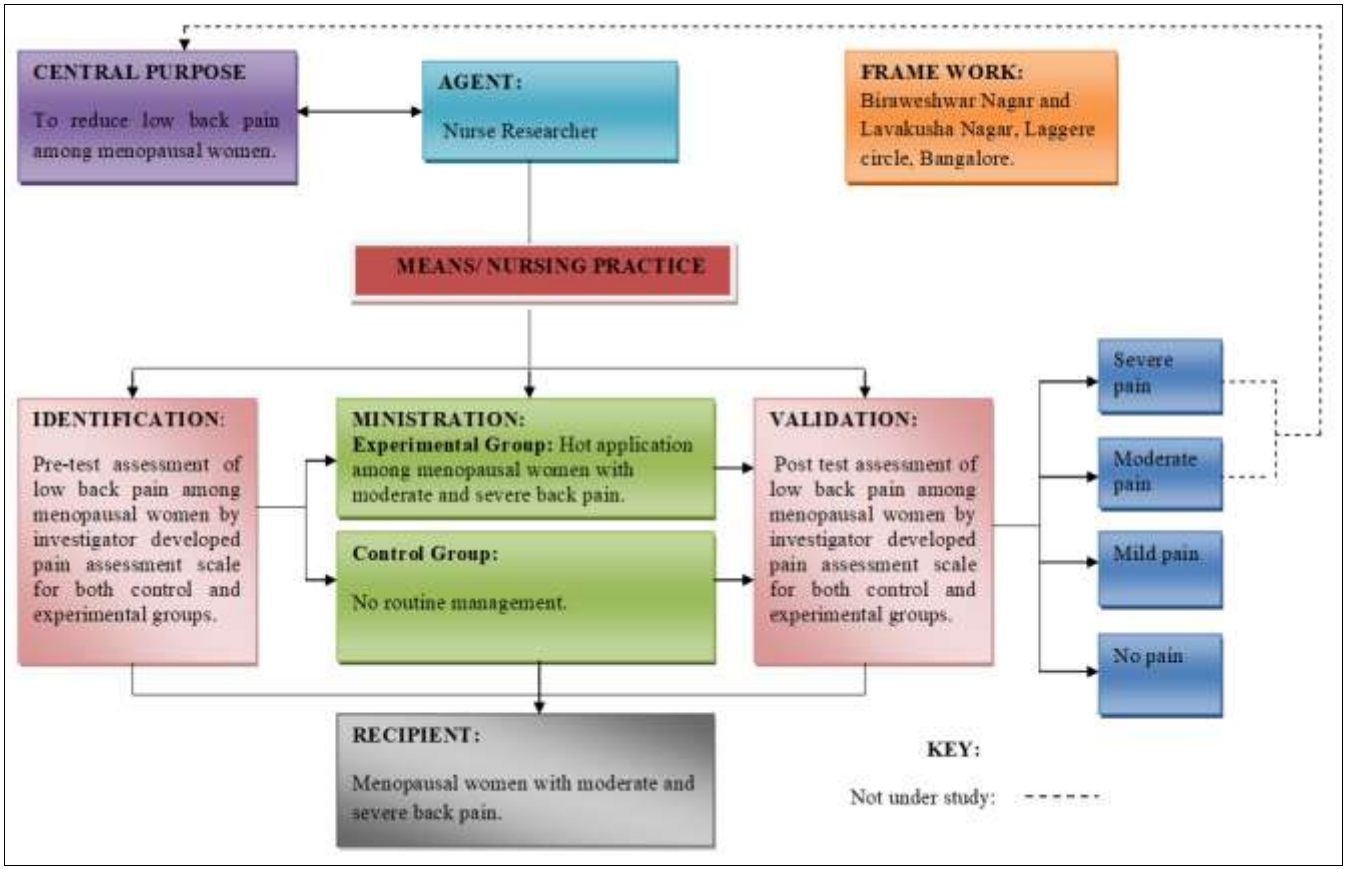

Fig 1: Conceptual Frame Work Modified from Ernestine Wiedenbach's The Helping Art of Clinical Nursing (1964).

Research design

Research design is the overall plan for addressing a research question, including specifications for enhancing the study's integrity. It is the back bone structure of the study. It determines how the study will be organized when the data will be collected and when the interventions are to be implemented in a way that is most likely to achieve the intended goal. The research design for the present study is true experimental design. The study tends to evaluate the effectiveness of hot application in reduction of back pain among menopausal women. The experimental and control groups are both assigned from a sample that are randomly selected. Comparison of the pre-test score is done to evaluate the effectiveness of randomization in providing equivalent groups. A schematic outline of the research design is given below:

Group	Measurement of dependent variable (level of back pain)	Hot application	Measurement of dependent variable (Level of back pain)
Randomly selected Experimental group	Pre-test → Treatment → Post-test		
Randomly selected control group	Pre-test → Post-test		

Setting

The researcher conducted the study in Biraweshwar Nagar and Lavakusha Nagar, which are under Laggere circle, Bangalore.

Population

Population consists of all menopausal women who are experiencing moderate to severe back pain in the area of Biraweshwar Nagar and Lavakusha Nagar, Laggere circle, Bangalore. The total houses in Biraweshwar Nagar is 440 and the total population is 2200 people, among them the population of menopausal women is 406 including 78 mild back pain, 189 moderate back pain and 139 severe back pain. So, 328 menopausal women fulfilled inclusion criteria among 406 menopausal women from whom samples were selected for experimental group.

In Lavakusha Nagar, the total houses were 450 houses, the total population being 2250 people and total population for menopausal women is 403 including 74 mild back pain, 187 moderate back pain and 142 severe back pain. So, 329 menopausal women fulfilled inclusion criteria among 403 menopausal women from whom samples were selected for control group.

Sample Size

The researcher conducts the present study with sample size of 70, 35 in experimental group from area of Biraweshwar Nagar and 35 in control group from Lavakusha Nagar.

Sampling technique

Simple random sampling using lottery method.

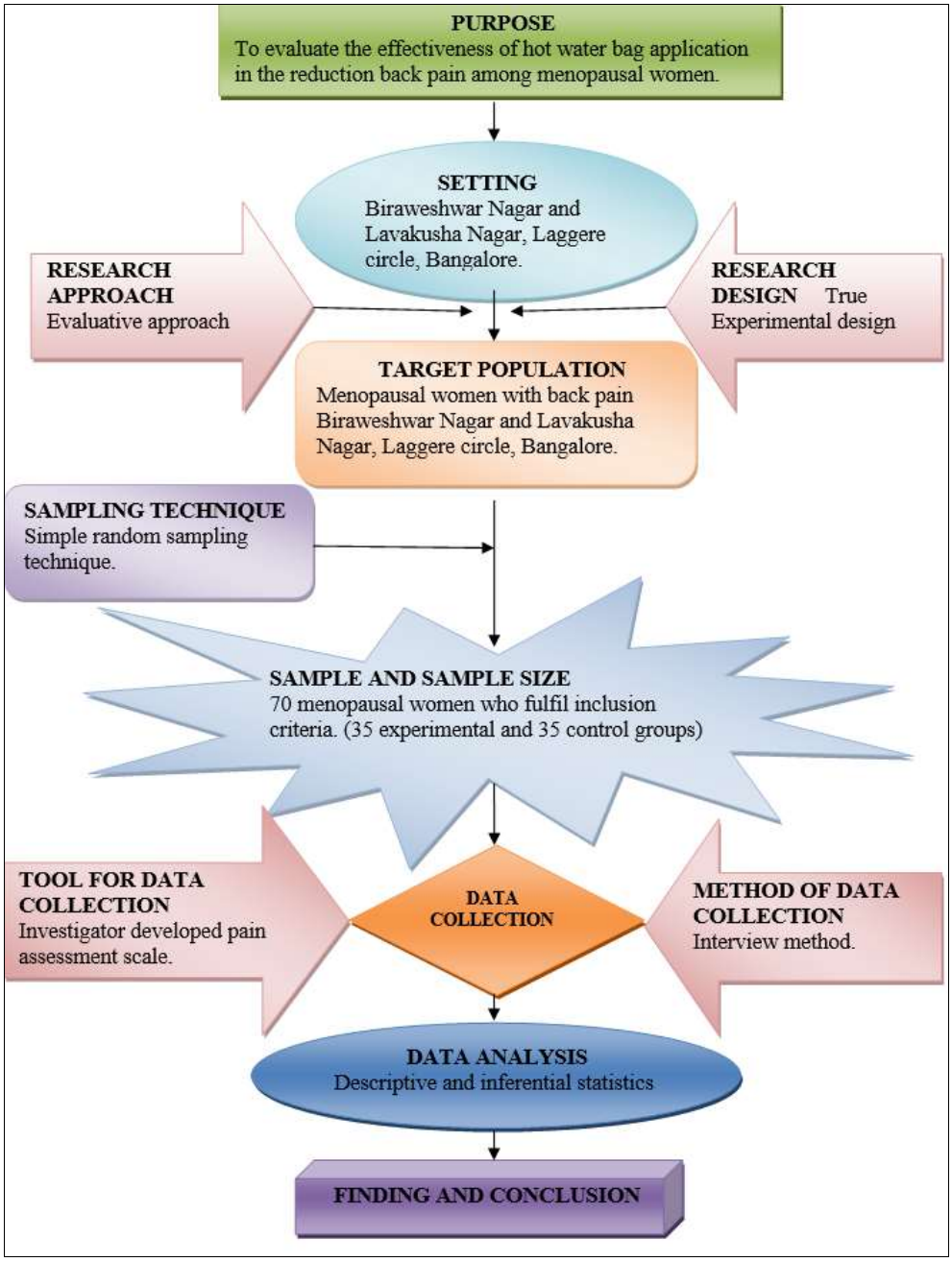

Fig 2: Schematic outline of True experimental research design.

Sampling criteria

1) Inclusion Criteria

- Who are willing to participate in the study.
- Who are available at the time of data collection.
- Who have moderate to severe back pain.
- Who can understand Kannada or English.

2) Exclusion Criteria.

- Who are having dermatitis.
- Who are having open wound at the site of lumbo-sacral region.
- Who are having spinal cord injuries.

Data collection techniques and instrument

Method of data collection includes development of tool, testing of validity, reliability and data collection procedure. Tools are the instruments used by the researcher to collect the data.

Section A: It consist of the demographic data of the sample.

Section B: It consist of Investigator developed Pain assessment scale modified from McGill pain questionnaires (1975), Wong Baker Faces Visual Analog Scale and Oswestry low back pain (1980).

After obtaining written permission from the Medical Officer, PHC, Laggere circle, Bangalore, data was obtained from 1st of August to 28th of August. The researcher identified 2 identical areas falling under Laggere circle PHC, namely Biraweshwar Nagar and Lavakusha Nagar because of the feasibility, proximity and similarity in population of both areas. Initially survey was carried out to identify the accessible population with moderate to severe back pain. Simple random sampling technique by lottery method was used to select 35 samples in experimental and 35 in control groups and consent was obtained for administering hot application. Pre-test was administered to samples in both the experimental and control groups.

Application of hot water bag was given to the women in the experimental group in batches of 5 for 3 days at the end of which post-test was done. Similarly post-test was also carried out for women in the control group. Considering the ethical issues, samples of the control group were also administered hot water bag after post-test.

Results

Table 1: Classification of pre-test level of back pain among the menopausal women in experimental and control groups. n(E)=35, n(C)=35

Pain Level	Category	Respondents			
		Experimental groups		Control groups	
		Number	Percentage (%)	Number	Percentage (%)
Moderate	14-26	15	42.86	12	34.29
Severe	27-40	20	57.14	23	65.71
Total		35	100	35	100
x^2 value		0.544 NS			

NS: Non-significant, $x^2(0.001, 1\ df)=10.83$

Table 2: Pre-test mean, mean percentage and standard deviation of back pain scores of menopausal women in the experimental and control groups. n(E)=35, n(C)=35

Group	Maximum score	Range	Pain Score		
			Mean	Mean percentage	SD
Experimental	40	21-35	28.00	70.00	3.638
Control	40	22-33	27.89	69.73	3.367

Table 3: Classification of post-test level of back pain among the menopausal women in experimental and control groups. n(E)=35, n(C)=35

Pain Level	Category	Respondents			
		Experimental groups		Control groups	
		Number	Percentage (%)	Number	Percentage (%)
Mild	1-13	24	68.57	00	00.00
Moderate	14-26	11	31.43	12	34.29
Severe	27-40	00	00.00	23	65.71
Total		35	100	35	100
x^2 value		47.044***			

***Significant at $p< 0.001$ level $x^2(0.001, 2\ df)=13.82$

Table 4: Post-test mean, mean percentage and standard deviation of back pain scores among menopausal women in the experimental and control groups. n(E)=35, n(C)=35

Group	Maximum score	Range	Pain Score		
			Mean	Mean percentage	SD
Experimental	40	6-18	11.286	28.215	3.770
Control	40	22-33	27.886	69.715	3.367

Table 5: Within group comparison of Pre-test and Post-test pain levels in the experimental group. n(E)=35

Aspects	Maximum score	Pain score			Paired 't' test
		Mean	Mean percentage	SD	
Pre-test	40	28	70	3.638	33.297***
Post-test	40	11.286	28.215	3.77	
Difference	40	16.714	41.785	2.919	

***Significant at $p<0.001$level, t (0.001, 34 df) = 3.646

Table 6: Within group comparison of Pre-test and Post-test pain level in the control group. n(C)=35

Aspects	Maximum score	Pain score			Paired 't' test
		Mean	Mean percentage	SD	
Pre-test	40	27.89	69.73	3.367	0.374 NS
Post-test	40	27.80	69.50	2.495	
Difference	40	00.09	00.23	1.358	

NS: Not Significant, t (0.001, 34 df) = 3.646

Table 7: Between group comparison of Pre-test pain level in the experimental and the control groups. n(E)=35, n(C)=35

Group	Maximum score	Pain score			Student 't' test
		Mean	Mean percentage	SD	
Experimental	40	28.00	70.00	3.638	0.131 NS
Control	40	27.89	69.73	3.367	

Not Significant, t (0.001, 68 df)= 3.460

Table 8: Between group comparison of Post-test pain levels of the experimental and the control group. n(E)=35, n(C)=35

Group	Maximum score	Pain score			Student 't' test
		Mean	Mean percentage	SD	
Control	40	27.886	69.715	3.367	19.438***
Experimental	40	11.286	28.215	3.77	

***Significant at $p<0.001$ level, t (0.001, 68 df) = 3.460

Conclusion

"Present Study Aimed To Evaluate The Effectiveness Of Hot Application In The Reduction Of Back Pain Among Menopausal Women".

Total sample size is 70, and among them majority of the menopausal women i.e, in pre-test 15(42.857%) participants had severe back pain and 20(57.143%) had moderate back pain h the experimental group. In post-test, 20(68.57%) had a mild pain as followed by 11(31.429%) were having moderate pain in the experimental group. And in the control group, 12(34.286%) had moderate pain and 23(65.71%) had severe back pain in the pre-test and in the post-test also the value is almost same i.e, 12(34.29%) had moderate pain and 23(65.71%) had severe back pain. So, the result of the study revealed that there is reduction in the menopausal back pain after hot application among experimental group whereas the level of back pain in the control group remains the same in the post-test also.

Within group comparison was done by using paired't' test and it shows significance at $p<0.001$ level ('t'=23.297) for 34 df in the experimental group whereas no significance was seen for the control group ('t'=0.374).

Between group comparison done by using student or unpaired 't' test shows no significance in the pre-test, ('t'=0.131) but higher significance ($p<0.001$) in the post-test('t'=13.68) for 68 df.

Nursing Implications

Nursing Practice

Clinicians working with women traversing the menopausal transition should be aware that managing back pain symptoms among mid-life women requires consideration of their changing biology as well as their ongoing life challenges and health-related behaviours. Hot water bag application is a part of naturopathy. Nurses as a professional health care practitioner, are legally responsible for safe administration of hot water bag application. It is home-based, cheap and easy to practice, so the procedure should be in tip of the nurses' hand and should have the ability to demonstrate the procedure to the client, family members and relatives, as unsafe practice may leads to some of the complication like burns, blister etc. And it is such a practice that has lots of advantage and everyone can also learn easily.

Nursing education

Menopausal women are the population who are taking care of the entire family members including her. Back pain in the menopausal women has deleterious effect on women's health, her functional status and her ability to take care of the entire family members. So, their health is of a core importance in order to make everyone in the family healthy. And hot water bag application is such an intervention that needs no much energy, money and material in spite of having more benefits. Education of the family, friends, society and health care providers regarding the importance of hot water bag application must be encouraged. The new nurses should be taught the procedure and practice of hot water bag application for the reduction of back pain which is the major health problems all over the world. So, as a health professional it is very much needed to acquire knowledge regarding hot water bag application and to educate all the concerned people in such a community areas where there are less income.

Nursing research

Nursing research midwife must recognize the important role that supports in achieving effective care for the menopausal women with back pain. Midwifery practice should be base on constantly evaluated research rather than being best purely on customs and traditions. By utilizing current research as well as carrying out research of their own, the midwife can determine the requirements or needs of menopausal women for providing a holistic care with an individual approach. It is in this way that midwife will facilitate the restoration of menopausal women's physical health and autonomy. Studies bring about the fact that the menopausal women had lots of physical problems and back problem is the most common one. So, it is important to focus on the areas of back pain among menopausal women in order to develop the practice and skills in hot water bag application. With the help of this study we come to know about the effectiveness of hot water bag application for menopausal back pain and this study can be the baseline for the future studies to built upon like hot water bag application for other type of pain or other type of hot application for menopausal back pain.

Nursing administration

Nursing administrator can plan and arrange continuing education program for nursing personnel regarding preventive measures of back pain among menopausal women. Nursing administrator can emphasize and encourage the nurses to use hot water bag as it is simple and easy procedure as well as cost effective. He/she can also formulate protocol for application of hot water bag in the reduction of menopausal back pain.

Recommendation for further study

1. A similar study can be conducted with a large sample to generalize the findings better.
2. Comparative study on the effectiveness of hot application can be done between menopausal women and antenatal mother's back pain or else postnatal mothers.
3. Study can be undertaken with the objective of developing a standard protocol for the management of back pain of menopausal women.
4. Study can be undertaken to compare two different treatment methods for reduction of back pain among menopausal women.

Conflict of Interest

Not available

Financial Support
Not available

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