

Effect of Acupressure on Quality of Life among Female Nurses with Chronic Back Pain



Asmaa Elsaied Elsayed¹, Wafaa Ismail Sherif² and Rasha Hassan Abass³

¹ Clinical Instructor at Technical Institute of Nursing, Mansoura University, Egypt

² Professor of Medical Surgical Nursing, Faculty of Nursing, Mansoura University, Egypt

³ Lecturer of Medical Surgical Nursing, Faculty of Nursing, Mansoura University, Egypt

E-mail address: drasmaaelbaz22@gmail.com dr_wafaaismail@yahoo.com

1. ABSTRACT

Background: Chronic Back Pain is the most common musculoskeletal work-related disorders among nurses. Acupressure is the type of complementary medicine frequently used today that involves pressing with fingers to stimulate acupoints of the human body to release endorphins which cause muscle relaxation and pain relief. **Aim of this study was to** determine the effect of acupressure on quality of life among female nurses with chronic back pain. **Design:** A quasi experimental research design was utilized. **Setting:** The study was conducted at all surgical and medical units at Mansoura University Hospital. **Sample:** A purposive sample of 100 female nurses with chronic back pain was distributed equally into two groups; Study group receiving acupressure sessions (I) and the control group received routine treatment plan (II). **Tools:** Three tools were used to collect data: Structured interview questionnaire, Pain assessment scale, Japanese Orthopedic Association Back Pain Evaluation Questionnaire (JOABPEQ). **Results:** Highly statistically significant difference in pain intensity and quality of life between two groups post acupressure sessions at ($p = <0.0001^*$) was observed. **Conclusion:** Acupressure is effective complementary therapy improves back pain, increase QOL and increase occupational function. Therefore, acupressure can be used as a drug-free and low-cost approach without side effects to improve quality of life in nurses with chronic back pain. **Recommendations:** Educational nursing program about effect and technique of acupressure should be conducted. Future research should include longitudinal studies with a cross-over design to document the long-range effects of acupressure for female nurses with chronic back pain.

Key words: Acupressure, Chronic back pain, Female nurses, Quality of life.

2. Introduction:

Nursing is a highly stressful career that has been ranked the second professions in terms of physical activity with high rates musculoskeletal disorders and chronic back pain that has about 80% prevalence in their professional life. Accounting for around 84.2% of the nurses experienced chronic back pain, and 66.7% of the nurses evaluated this pain as “a pain with moderate severity”. Nurses are the largest providers of healthcare services making up 70% of the healthcare staff (Ovayolu, Ovayolu, Genc & Col-Araz, 2020). Nurses are arguably the most important frontline healthcare professionals available in most healthcare facilities, performing a broad range of tasks. They carried out their activities in settings where no other health workers are available. Such tasks are considerably presumed in causing workload due to these and other reasons, nursing is listed among the highly risky professions to experience CBP. In line with this, the nursing profession is ranked within the top ten professions which have a great risk of CBP (Kasa, Workineh, Ayalew & Temesgen, 2020).

Chronic back pain will have many negative impacts on different aspects of the healthcare system including: absence from workplace, loss of optimal performance, low job satisfaction, rising medical costs and occupational disability (Asadi, Monsef Kasmaei, Ziabari & Zohrevandi, 2019). Complementary therapies, which are safe, noninvasive, and generally considered to be relatively free of toxicity, may be used as a pain management is acupressure to improve outcome. Examples of commentary therapies which effectively manage chronic back pain and help those nurses to adopt a healthier life style are physical exercises, acupuncture, transcutaneous electrical nerve stimulation, spinal manipulation, relaxation techniques, and acupressure (Malfliet et al., 2019).

Acupressure is one of the therapeutic modalities in traditional Chinese medicine; it has been used for decreasing pain, illness, and injury for centuries. Acupressure its involves mainly applying gentle but strong pressure by fingers over meridians and acupoints, it is carried out without

the use of needles which activates endorphin release that contributes to muscle relaxation and pain relief (Koes et al., 2016).

Complementary medicine is a remarkable place today, with one out of every three people using it at some point in their lives. Acupressure is a type of complementary and alternative medicine, it is noninvasive, low cost, needs no guidance for administration, is affordable compared to other with medical methods (Godley, & Smith, 2020). Pain symptom generally negatively affects the quality of life of patients, and acupressure is one of the most common therapies accessed by people with acute and chronic pain and approved significant increases in their quality of life (Çevik, & Taşci, 2020).

Aim of the study

The aim of this study was to determine the effect of acupressure on quality of life among female nurses with chronic back pain.

Research hypothesis:

The nurses who receive acupressure exhibit less back pain and improve QOL than those who don't receive it.

Materials and Method

Study design:

A quasi-experimental research design was used in this study.

Setting:

This study was conducted at all surgical and medical units of the Mansoura University Hospital. The hospital contains six surgical units namely (Cardiothoracic, Colorectal and Gastroenterology, Oncology, Vascular, Urology and neurosurgery units) and contains six medical units, i.e., (Cardiopulmonary, Gerontology, Hepatobiliary, Endocrine, Rheumatology and Nephrology units). Each unit divided into eight rooms and each room contains approximately from 3 to 8 nurses. Total beds number in all surgical units are 350 beds, average 58 beds/unit. Total beds number in medical units is 300 beds, average 50 beds/unit. Each nurse will responsible for caring almost four room, where the nurse to patients 1:28 with average number 1:10.

Subjects:

A purposive sample of 100 female nurses who are working in the above-mentioned settings. Nurses were selected according to inclusion criteria and distributed into two equal groups; group I (study group) who received acupressure sessions and group II (control group) who received routine treatment plan. Inclusion criteria of nurses aged

between 20 to 60 years old, and suffering from chronic back pain and under medical treatment and exclusion criteria nurses suffering from chronic back pain caused by systemic diseases, nurses with irregular menstrual cycle and motor loss.

Tools of data collection

Three tools were used in this study for data collection as the following:

Tool I: Structured Interview Questionnaire: This tool was developed by the researcher after review of relevant literature (Najafabadi, Ghafari, Nazari & Valiani, 2020) This tool consists three main parts:

Part I: Socio-demographic data: including age, sex, residence, marital status, department, educational level, number of hours standing during work, numbers of working hours per week, home responsibilities and monthly income.

Part II: Nurses' quality of life related to back pain; it was adapted from Wisconsin Quality of Life Client Questionnaire and the Oswestry chronic Back Pain Disability Questionnaire (2018), and translated into Arabic it is used to collect data about four health domains, including physical, psychological, social and environmental health domains.

The scoring system of QOL:

The tool consists of four health domains scores, which were the weighted sums of the questions in their section. The four health domains are: physical (16 questions), psychological (11 questions), social (5 questions) and environmental (9 questions) health domains. Each health domain is directly transformed into a 0-100 scale on the assumption that each question carries equal weight (0=0, 1=50, 2=100). The higher the score, the better quality of life. Total scale scores represent the average for all items in the health domains that the respondent answered.

Part III: Satisfaction level of nurses with chronic back pain (Suet-Ching, 2001): to assess satisfaction level, as it comprised (9) items namely: support from family, friends, ability to support others, health care services and the cost of the treatment, personal safety, the income, working and sexual relation. Satisfaction level is rated as (0) dissatisfied, (1) moderately satisfied, (2) very satisfied. The higher score the better satisfaction level.

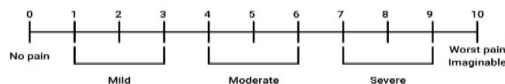
Tool II: Pain Assessment Scale: This tool consists of two main parts:

Part I: Pain assessment scale was developed by the researcher based on literature review

(Carr & Wittink, 2015) and included questions related to assess pain site, character, and duration, aggravating and alleviating factors.

Part II: Numerical Rating Scale (NRS) (McCaffery & Pasero, 2013), to assess pain intensity. It is a straight line that comprises 10-point scale. with the left end of the line "0" representing no pain. 1-3 mild pain. 4-6 moderate pain, 7-9 severe pain and the right end of the line "10" represent the worst degree of pain.

Numerical Pain Intensity Scale (NAS):



Tool III: Japanese Orthopedic Association Back Pain Evaluation Questionnaire (JOABPEQ): it was adopted from (Hashizume et al., 2015) to evaluate the functional abilities of the nurses. It was composed of structured interview schedule that include twenty-five behavioral statements.

Scoring system of JOABPEQ:

Questions from 1 to 14 are closed ended questions with "yes" or "no" answer. While questions from 15 to 25 are in the form of Likert scale. Questions 15, 19, 20, 21, 22, 23, 24, and 25 scored from 1 to 5; 1 indicated never or poor, 2 indicated rarely or fair, 3 indicated sometimes or good, 4 indicated almost always or very good, 5 indicated always or excellent. Questions 16, 17 and 18 are scored from 1 to 3; 1 indicated "I have great difficulty", 2 indicated "I have some difficulty", while 3 indicated "I have no difficulty (1 = I have great difficulty is the worst and 3 = I have no difficulty is the best). Questions 19, 21, 22 and 25 are negative questions and took a reverse score. It includes;

1- Physical function including;

- Low back pain (questions number 1, 3, 7, and 11).
- Walking ability (questions number 10, 12, 14, 16, and 18).
- Lumbar function (questions number 4, 5, 6, 8, 9, and 17).

2- Psychological function (questions number 13, 15, 21, 22, 23, 24, 25)

3- Social function (questions number 2, 18, 5, and 20).

Methods:

Administrative preparation: An official approval was granted from Research Ethical Committee, Faculty of Nursing Mansoura

University. Permission to carry out the study was obtained from the responsible authorities of the Mansoura university Hospital after an explanation of the aim of the study.

Ethical consideration: Prior to the study, verbal consent was obtained from each nurse who agreed to participate in the study after explanation of study's nature and aim for studied nurses. The researcher emphasized that participation is voluntary and confidential. Anonymity, privacy, safety, and confidentiality were absolutely assured throughout the whole study. Nurses were informed that they have the right to withdraw from the study at any time without giving any reason.

Validity of the tools: Tools of the study tool I (part one) and tool II (part one) were developed by the researcher. Study tools were tested for content validity for both English and Arabic versions were tested by 5 experts in the field of medical surgical nursing. The required corrections and modifications were carried out accordingly as duplication in some items were removed, some misunderstood items were written more clear and some items were added. The tools were then revised by some jury members until the final formats were developed.

A pilot study was carried out on 10 % of the subjects (10 nurses) from the study settings for testing the clarity, applicability, relevance, and feasibility of the tools, and identify the difficulties which may be faced during its application, and to estimate the time needed for data collection. Subjects who included in the pilot study were excluded from the study sample.

A reliability of the tools was done for its internal consistency using Cronbach's Alpha coefficient test; Tool I was reliable as $r = 0.82$, tool II $r = 0.93$, tool III $r = 0.93$.

Procedure:

The researcher received special training course in field of acupressure at the Mersal Center" and took a certificate in "Injuries, Acupressure Massage and Body Rehabilitation in Adults". In the period from 1 to 30 November 2020.

The researcher interviewed with each nurse of both groups in four constructive phases namely: assessment, planning, implementation, and evaluation Phase:

Assessment phase:

During this phase, hundred female nurses with CBP was selected according inclusion and exclusion criteria and assigned into two equal groups:

- **Group (I):** Received acupressure (**Study group**).
- **Group (II):** Received routine treatment plan (**Control group**).
- The researcher introduced herself to the nurses, explained the aim of the study and took the oral consent from nurses, the researcher emphasized the importance of active participation, simultaneously, the nurse right to withdraw at any time without any embarrassment, they take part in the study on a voluntary basis.
- Once the necessary approval granted to proceed with the proposed study, nurses who met inclusion criteria and accepted in the study were individually interviewed.
- Regarding control group who received routine treatment plan and didn't receive any intervention were assessed firstly during morning and evening shift for CBP by using tools (I, II, and III) to avoid data contamination of the sample.
- All nurses were assured that confidentiality of the collected data was maintained and the results was used for research purposes as well as for future publication and education only.
- An initial assessment of both groups was carried out before implementing acupressure sessions to obtain baseline data using the prepared study tools (Tool I, II, III). the assessment was completed within (30-45 minutes) according to nurses' level of education and understanding.

Planning phase: (for the study group only): Based on the finding of the assessment phase goals, priorities, and expected outcomes of data collected to identify nurses need was formulated. Each nurse from both groups was assessed by the researcher using three tools.

- Theresearcher planned for applying acupressure sessions on 50 female nurses with CBP over a period of six months.

Pressure sequence of acupressure session

Areas / Location	Technique used for giving pressure
1- (DU 5) below the spinous of the 1 st lumbar vertebra.	Thumb walking in a circular movement, in clockwise direction.
2- (BL23) 1,5 cm lateral to the lower border of the spinous process of the 2 nd lumbar vertebra.	Thumb walking in a circular movement, in clockwise direction.
3- (DU 4) below the spinous of the 2 nd lumbar vertebra.	Thumb walking in a circular movement, in clockwise direction.
4- (BL 25) 1,5 cm lateral to the lower border of the spinous process of the 4 th lumbar vertebra.	Thumb walking in a circular movement, in clockwise direction.
5- (DU 3) below the spinous process of the 4 th lumbar	Thumb walking in a circular movement, in clockwise

- In this phase, (9) sessions were planned by the researcher for female nurses with chronic back pain at rate (3) sessions per week for (3) consecutive days for (3) weeks to applying all acupressure sessions for them.

Implementation phase: (for the study group only): in this phase the researcher interviewed every nurse individually before starting the session to collected nurse's data using study tool.

- The researcher was available at the previously mentioned setting on the morning and evening shift. The nurse was interviewed in empty separate room. This room was clean and well ventilated.
- Every nurse in the study group received complete acupressure session for 30- 45 min to all acupressure point guided by acupressure map.
- Implementation of acupressure sessions program which included ten sessions that divided in two types of sessions: Theoretical and Practical sessions for acupressure group as the following:

Theoretical session: were carried out in one session and it is including:

Definition of CBP, risk factors, signs and symptoms, diagnosis, treatment, meaning of acupressure, benefits of acupressure, mechanism of acupressure, contraindication of acupressure and general precautions that should be considered before, during and after acupressure technique.

Practical sessions: were carried out in nine sessions as the following: acupressure program was done using finger message in a circular movement, in clockwise direction, at specified acupoints bilaterally for about 3-5 minutes for each point. The nurse reported a deep, numbing sensation. Acupoints were allocated using the finger measurement method.

vertebra	direction.
6- (BL 36) in the middle of the transverse gluteal fold.	Thumb walking in a circular movement, in clockwise direction.
7- (BL 37) 6 cm below BL 36.	Thumb walking in a circular movement, in clockwise direction.
8- (BL40) behind knee, on the center of the crease.	Thumb walking in a circular movement, in clockwise direction.
9- (BL55) 2cm directly below BL 40	Thumb walking in a circular movement, in clockwise direction.
10- (L 14) between the first and second metacarpal bones	Thumb walking in a circular movement, in clockwise direction.



Fig 1: Regulation in complementary and alternative medicine (Mills, 2017).

- Acupressure session was explained by the researcher for every study subject. Reassure the nurse that acupressure is safe and will not hurt her.
- The researcher prepared needed equipment's: acupressure map, two linens, stop watch, alcohol, soap dish, baby oil, tissue paper and hand towel, all supplies brought by the researcher except linens were taken from the units.
- Positioning (comfortable position): the nurse instructed to lie on the prone or supine according to site of pressure.
- Every nurse taught deep breathing exercise technique by the researcher. She was instructed to take deep breathing to provide relaxation before beginning acupressure session and the nurse was instructed also not to talk during the session or use the mobile to prevent interruption.
- The researcher washes her hands, dried it, sit facing the subject on a chair in comfortable position and took deep breathing to be relaxed before starting acupressure session, the researcher assumed standing at any time during acupressure session to give pressure in correct manner if the setting position didn't allow for this.
- The researcher warmed her hands by rubbing them together for a few seconds to prevent touching the nurse with cold hands.
- **Data collection extended from March 2021 to the end of August 2021.**
 - Evaluation phase:** In this phase final assessment was done after completion of nine sessions of acupressure using tool I, II and III. Each nurses in study and control group assessed pre and post (3rd weeks) of acupressure sessions. While, tool II assessed pre and post each sessions for comparing the effectiveness of acupressure. The researcher takes phone number for each study subject to keep contact with them after 3 weeks.
 - Data Analysis:** After data were collected it was revised, coded and fed to statistical software SPSS version 20. all statistical analysis was done using two tailed tests and alpha error of 0,05, P value less than or equal to 0,05 is considered to be significant.

Results:

Table (I): Shows percentage distribution of the studied nurses according to their socio-demographic characteristics. It can be noted that the age of the study group of 20-30 years was the highest percentage with mean age 37.32±10.72 and control group was 38.36±10.77. Regarding to marital state, it was noticed that more than two

thirds in both study and control groups were married (70.0% & 76.0%) respectively. Concerning the level of education, it represents that nearly half of the study and control group were diploma in nursing (50.0% & 52.0%) respectively. Regarding to residence, the majority of the study and control groups were from rural area (86.0% & 78.0 %) respectively. Regarding to monthly income, 64.0% in study group and 76.0 % in control group were less than enough. This indicated that there were no significant differences related to socio-demographic characteristics.

Table (II): Shows percentage distribution of the studied nurse's according to their occupational role. It can be noted that three fifths of both study and control groups were working in surgical units (58.0 % & 60.0%) respectively. Concerning work experience, the result revealed that more than one half of study group and two fifths of the control group were experienced less than 1-10 years (52.0% & 40.0%) respectively. Regarding to numbers of working hours per week, it was noticed that the majority of study and control groups were working <48 hours per week (94.0% & 88.0%) respectively.

Regarding to standing hours during work, it represents that one half of study group and two thirds of control group were standing from 3 hrs – 6 hrs (50.0% & 66.0%) respectively. Concerning trained use of body mechanics, it was found that slightly more than three quartiles of study group and more than two thirds of control group hadn't trained to use body mechanics (76.0% & 70.0%) respectively. Regarding to receiving assistance in home responsibilities, the majority of study group and nearly three quartiles of control group don't receive assistance in home responsibilities (80.0% & 72.0%). Regarding to receiving health teaching to reduce back pain, 100.0% of study and control groups don't receive health teaching to reduce back pain. This indicated that there were no significant differences related to occupational data.

Table (III): Shows comparison between study and control group regarding quality of life subscales among studied nurses and test of significance at pre and post (3rd weeks) acupressure sessions. This results revealed that, there were no significant statistical differences between study and control groups pre acupressure regarding physical, psychological, social, and environmental health of quality of life as p-value > 0.05. While, there was a highly significant statistical difference between both study and control group post applying acupressure sessions regarding physical,

psychological, social, and environmental health of quality of life as p-value < 0.0001**.

Table (IV): Shows percentage distribution of pain intensity among studied nurses and test of significance at pre and post all acupressure sessions. This results revealed that pain intensity pre the first session in the study and control groups experienced severe pain (87.9% & 84.8%) respectively. Whereas, pain intensity in the study group post the first session found 72.7% had mild pain compared to the majority of the control group (87.9%) had severe pain. As regard to pain intensity pre the second session, it showed equal percentage (84.8%) of both groups had severe pain. While pain intensity post second session, 87.9% of the study group experienced mild pain compared to (90.0%) of the control group had experienced severe pain.

Concerning pain intensity pre the third session, the results showed that both group had equal percentage (78.8%) of severe pain. The majority of the study group (90.9%) experienced mild pain compared to (84.8%) of the control group had experienced severe pain post third session. The results revealed that both groups experienced severe pain pre fourth session (69.7%, & 84.8%) respectively. While pain intensity post the fourth session, the majority of the study group (93.9%) experienced mild pain compared to 90.9% for the control group had experienced severe pain.

Also, results indicated that, 60.6% of the study group and 90.9% of the control group had severe pain pre the fifth session. While post the fifth session, found 93.9% of the study group experienced mild pain compared to (93.9%) in the control group experienced severe pain. In relation to pain intensity pre the sixth session, it was found that 72.7% of the study group and 97.0% of the control group had severe pain. While post the sixth session, all study group experienced mild pain compared to (100.0%) in the control group experienced severe pain.

As regard to pre seventh session, 60.6% of the study group and 97.0% of the control group had severe pain. While, 100.0% of the study group experienced mild pain compared with 97.0% of control group experienced severe pain post seventh session. Regarding pain intensity pre the eighth session, 51.5% of the study group compared to 97.0% of the control group had severe pain. While, all study group (100.0%) experienced mild pain compared with (97.0%) of control group had severe pain at post eighth session.

This results revealed that there was no statistically

significant differences pre the 1st, 2nd, 3rd, and 4th acupressure sessions between both groups. Whereas, the results revealed a significant difference between two groups at pre acupressure sessions from session 5th to 9th sessions and post acupressure for all nine sessions where ($p < 0.0001^*$).

Table (V): Show function subscale mean score of Japanese Orthopedic Association Back Pain Evaluation Questionnaire (JOABPEQ) among studied nurses and test of significance at pre and post (3rd weeks) acupressure sessions. The present study represents that, the mean of Low back pain in study group was 7.42 ± 14.78 pre applying acupressure sessions which improved to 82.85 ± 21.28 post applying acupressure sessions. Also, the mean of low back pain in control group was 6.00 ± 12.61 pre applying acupressure sessions which become 7.14 ± 14.78 post applying acupressure sessions.

While, the mean of lumbar functions in study group was 18.50 ± 10.81 pre applying acupressure sessions which improved to 80.33 ± 13.33 post applying acupressure sessions. Also, the mean of lumbar functions in control group was 20.00 ± 16.91 pre applying acupressure sessions which become 20.50 ± 16.25 post applying acupressure sessions.

Also, the mean of walking function in study group was 14.57 ± 16.19 pre applying acupressure sessions which improved to 71.85 ± 8.70 post

applying acupressure sessions. While, the mean of walking functions in control group was 19.57 ± 22.89 pre applying acupressure sessions which become 20.00 ± 20.81 post applying acupressure sessions.

Additionally, the mean of social life function in study group was 13.51 ± 11.98 pre applying acupressure sessions which improved to 38.91 ± 11.67 post applying acupressure sessions. While, the mean of social life function in control group was 15.89 ± 9.32 pre applying acupressure sessions which decreased to 15.62 ± 8.79 post applying acupressure sessions.

While, the mean of psychological life function in study group was 23.80 ± 9.00 pre applying acupressure sessions which improved to 48.93 ± 10.15 post applying acupressure sessions. Also, the mean of Psychological life function in control group was 24.87 ± 9.27 pre applying acupressure sessions which decreased to 24.89 ± 8.47 post

applying acupressure sessions

This table showed that regarding physical, psychological and social life function that no statistical significant differences were existed between study and control group pre applying acupressure sessions while there was a statistical significant difference between study and control group post applying acupressure sessions.

Table (I): Percentage distribution of the studied nurse's according to their socio-demographic characteristics (N=100)

Socio-demographic characteristics	Study groups (N=50)		Control group (N=50)		Signification Level
	N	%	N	%	
Age (years)					
20 / < 30	19	38.0	18	36.0	$X^2 = 0.589$ $P = 0.899$
31 / < 40	6	12.0	6	12.0	
41 / < 50	16	32.0	14	28.0	
51 / \geq 60	9	18.0	12	24.0	
Mean \pm SD	37.32 ± 10.72		38.36 ± 10.77		
Marital status					
Single	3	6.0	6	12.0	$X^2 = 3.246$ $MC = 0.372$
Married	35	70.0	38	76.0	
Widowed	3	6.0	2	4.0	
Divorced	9	18.0	4	8.0	
Educational level					
Diploma	25	50.0	26	52.0	$X^2 = 1.020$ $P = 0.647$
Bachelor of nursing	9	18.0	12	24.0	
Master's degree in nursing	16	32.0	12	24.0	
Doctoral degree	0	0.0	0	0.0	
Residence					
Rural	43	86.0	39	78.0	$X^2 = 1.084$ $P = 0.298$
Urban	7	14.0	11	22.0	
Monthly income					
Less than enough	32	64.0	38	76.0	$X^2 = 1.714$ $P = 0.190$
Enough	18	36.0	12	24.0	

X^2 : Chi-Square test, MC: Monte Carlo test, * level of significance= ≤ 0.05

Table (II): Percentage distribution of the studied nurse's according to their occupational role (N=100)

Occupational data	Study groups (N=50)		Control group (N=50)		Signification level
	N	%	N	%	
Working Department					
Surgical units	29	58.0	30	60.0	X ² = 3.664 P= 0.056
Medical units	21	42.0	20	40.0	
Years of work experience as a nurse					
>1-10 years	26	52.0	20	40.0	X ² = 1.989 MC= 0.583
11-20 years	10	20.0	14	28.0	
21-30 years	9	18.0	12	24.0	
31-40 years	5	10.0	4	8.0	
Numbers of working hours per week					
<48 hours	47	94.0	44	88.0	FE= 0.487
>48 hours	3	6.0	6	12.0	
Number of hours standing during work					
< 1 hour	4	8.0	4	8.0	X ² = 3.315 MC= 0.335
1 hrs < 3 hrs	16	32.0	11	22.0	
3- 6 hours.	25	50.0	33	66.0	
>6 hours	5	10.0	2	4.0	
Trained to use body mechanics					
Yes	12	24.0	15	30.0	X ² = 0.457 P= 0.499
No	38	76.0	35	70.0	
Receiving assistance in home responsibilities					
Yes	10	20.0	14	28.0	X ² = 0.877 P= 0.349
No	40	80.0	36	72.0	
Received health teaching to reduce back pain					
Yes	0	0.0	0	0.0	----
No	50	100.0	50	100.0	

X²: Chi-Square test, FE: Fisher's Exact test, MC: Monte Carlo test, * level of significance= ≤0.05

Table (III): Comparison between study and control group regarding quality of life subscales among studied nurses and test of significance at pre and post (3rd weeks) acupressure sessions

QOL Subscales		Study group	Control group	T-test
		Mean ± SD	Mean ± SD	
Physical health	Pre	54.81±8.73	52.87±7.88	P1= 1.165 (0.247)
	Post	76.81±10.82	54.56±8.88	P2= 11.231 (<0.0001) **
Psychological health	Pre	40.54±12.07	36.72±8.75	P1= 1.811 (0. .073)
	Post	63.65±13.53	40.36±8.14	P2= 10.425 (<0.0001) **
Social Health	Pre	44.00±13.40	41.40±12.29	P1= 1.011 (0. .314)
	Post	73.40±10.42	41.00±12.81	P2= 13.869 (<0.0001) **
Environmental health	Pre	42.44±13.07	38.77±15.16	P1= 1.295 (0. .198)
	Post	76.22±10.53	42.88±13.70	P2= 13.639 (<0.0001) **
Total QOL score	Pre	45.45±7.02	42.44±7.04	P1= 2.136 (0.053)
	Post	72.52±8.61	44.70±7.60	P2= 17.119 (<0.0001) **

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Student t-test (P1): Comparing study and control group pre the acupressure

Student t-test (P2): Comparing study and control group post the acupressure

*the difference is statistically significant at $p \leq 0.05$

QOL: Quality of life (increased scores denotes improvement)

Table (IV): Percentage distribution of pain intensity among studied nurses and test of significance at pre and post all acupressure sessions(N=100)

Pain intensity		Studygroup (n=50)		Control group (n=50)		Signification level
		N	%	N	%	
Pre first session	Moderate	6	12.1	7	15.2	FE= 1.0
	Severe	44	87.9	43	84.8	
Post first session	Mild	36	72.7	0	0.0	X ² = 54.923 P < 0.0001*
	Moderate	14	27.3	6	12.1	
	Severe	0	0.0	44	87.9	
Pre second session	Moderate	8	15.2	8	15.2	X ² = 0.0 P= 1.0
	Severe	42	84.8	42	84.8	
Post second session	Mild	44	87.9	0	0.0	X ² = 59.143 P < 0.0001*
	Moderate	6	12.1	5	9.1	
	Severe	0	0.0	45	90.9	
Pre third session	Moderate	11	21.2	11	21.2	X ² = 0.0 P= 1.0
	Severe	39	78.8	39	78.8	
Post third session	Mild	45	90.9	0	0.0	X ² = 58.5 MC < 0.0001*
	Moderate	5	9.1	8	15.2	
	Severe	0	0.0	42	84.8	
Pre fourth session	Moderate	15	03.3	8	15.2	X ² = 0.0 P= 1.0
	Severe	35	69.7	42	84.8	
Post fourth session	Mild	47	93.9	0	0.0	X ² = 58.5 MC < 0.0001*
	Moderate	3	6.1	5	9.1	
	Severe	0	0.0	45	90.9	
Pre fifth session	Mild	2	3.0	0	0.0	X ² = 58.5 MC < 0.0001*
	Moderate	18	36.4	5	9.1	
	Severe	30	60.6	45	90.9	
Post fifth session	Mild	47	93.9	0	0.0	X ² = 8.4 MC= 0.007*
	Moderate	3	6.1	3	6.1	
	Severe	0	0.0	47	93.9	
Pre sixth session	Moderate	14	27.3	1	3.0	X ² = 7.543 P= 0.006*
	Severe	36	72.7	49	97.0	
Post sixth session	Mild	50	100.0	0	0.0	X ² = 66.0 P< 0.0001*
	Moderate	0	0.0	50	100.0	
Pre seventh session	Moderate	20	39.4	1	3.0	X ² = 13.055 P< 0.0001*
	Severe	30	60.6	49	97.0	
Post seventh session	Mild	50	100.0	0	0.0	X ² = 66.0 MC < 0.0001*
	Moderate	0	0.0	1	3.0	
	Severe	0	0.0	49	97.0	
Pre eighth session	Moderate	24	48.5	1	3.0	X ² = 17.827 P< 0.0001*
	Severe	26	51.5	49	97.0	
Post eighth session	Mild	50	100.0	0	0.0	X ² = 66.0 MC < 0.0001*
	Moderate	0	0.0	1	3.0	
	Severe	0	0.0	49	97.0	
Pre ninth session	Moderate	26	51.5	1	3.0	X ² = 20.009 MC < 0.0001*
	Severe	24	48.5	48	93.9	
	V.severe	0	0.0	1	3.0	
Post ninth session	None	1	3.0	0	0.0	X ² = 66.0 MC < 0.0001*
	Mild	49	97.0	0	0.0	
	Moderate	0	0.0	1	3.0	
	Severe	0	0.0	48	93.9	
	V.severe	0	0.0	1	3.0	

Table (VI): Mean Score, SD and test of significance for Japanese Orthopedic Association Back Pain Evaluation Questionnaires (JOABPEQ) for total studied nurses at pre and post (3rd week) acupressure sessions

JOABPEQ		Study group	Control group	T-test
		Mean ± SD	Mean ± SD	
Physical function 1-Low back	Pre	7.42±14.78	6.00±12.61	P1= 0.520 (0.604)
	Post	82.85±21.28	7.14±14.78	P2= 20.707 (<0.0001) **
t-test (P) ^a		-20.280 (<0.0001) **	-0.893- (0.376)	
2-Lumber function	Pre	18.50±10.81	20.00±16.91	P1= -0.977 (0.331)
	Post	80.33±13.33	20.50±16.25	P2= 20.122 (<0.0001) **
t-test (P) ^a		-26.089 (<0.0001) **	-0.409 (0.685)	
3-Walking ability	Pre	14.57±16.19	19.57±22.89	P1= -1.261 (0.210)
	Post	71.85±8.70	20.00±20.81	P2= 16.253 (<0.0001) **
t-test (P) ^a		-21.311 (<0.0001) **	-0.308 (0.759)	
Social life function	Pre	13.51±11.98	15.89±9.32	P1= -1.107 (0.271)
	Post	38.91±11.67	15.62±8.79	P2= 11.273 (<0.0001) **
t-test (P) ^a		-28.212 (<0.0001) **	0.398 (0.692)	
Psychological health	Pre	23.80±9.00	24.87±9.27	P1= -0.584 (0.560)
	Post	48.93±10.15	24.89±8.47	P2= 12.853 (<0.0001) **

Discussion

Chronic back pain (CBP) is a prevalent occupational health problem that causes substantial physical, cognitive, sensory, emotional, and developmental challenges for nurses. It ranks second in terms of work-force loss and health-care costs behind cancer pain (Taguchi, Nakano, & Nozawa, (2021)). Acupressure is one strategy used in management of chronic back pain. It has a favorable effect on physical function and pain scores, which improves mobility, self-care behaviors, and quality of life among female nurses with chronic back pain. (Zhang et al., 2020). Complementary medicine has a special state. One type of complementary medicine is acupressure (Movahedi, Ghafari, Nazari, & Valiani, 2017), Pain symptom generally negatively affects the quality of life of patients, and acupressure is one of the most common therapies accessed by people with acute and chronic pain and approved significant increases in their quality of life (Çevik, & Taşcı, 2020). Therefore, this study was conducted to determine the effect of acupressure on quality of life among female nurses with chronic back pain.

Socio- demographic characteristics of the current study represented that, approximately more than one third of the studied nurses of both study and control groups were at third decade of age.

These results were consistent with Peng et al., (2022), who reported that the majority of studied groups were in the same third decade of age. While, contradicting with Rani, Sharma, & Advani, (2022), who reported that the most of the study subjects was in fourth decade of age. This may be explained as the traditional working styles and nurses' job descriptions in Egypt.

Regarding marital status, the present study revealed that the majority of the studied nurses of both study and control groups were married, this results were in line with Ganasegeran et al., (2020) who reported that the majority of the study subjects was married. However, these results disagreed with Gerami Nejad, Hosseini, Mousavi Mirzaei, & Ghorbani Moghaddam, (2019), who reported that the majority of study participants were divorced. This may be due to the age of selected nurses between twenty to thirty years and this is age of marriage in Egypt.

In relation to educational level, the current study it represents that nearly half of both study and control group were had diploma in nursing education. This result came in accordance with Cleveland et al. (2020), and Marshall, Forgeron, Harrison, & Young, (2018), who stated that the majority of studied subjects have diploma nursing education. While, dissimilar with Lackner &

Carosella, (2017), who reported that the majority of the study participants have bachelor's nursing education.

Regarding to residence, the current study showed that more than two third of studied nurses were from rural area. This result agrees with **Marshall, Forgeron, Harrison, & Young, (2018)**, and **Alluhidan et al., (2020)**, who stated that the majority of studied participants were from rural area. While, this is inconsistent with **Essawy, Abohadida, Abd-Elkader, Fathy, & Hassab, (2021)** who reported that most nurses were from urban area. This finding points toward the fact that some factors that make entirely surgical and medical units of the Mansoura University Hospital more attractive for rural nurses include (1) salaries in rural areas do not cover the opportunity cost of living (2) inadequate housing; (3) fewer opportunities for continued education, and (4) fewer work opportunities for spouses.

In relation to monthly income, the majority of studied nurses were reported that income was less than enough. Likewise, study done by **Dong, et al., (2021)**, who reported that the majority of studied nurses were had low monthly income. This may be due to most of studied nurses were enrolled in nursing diploma programs and had lower salary per month and in generally the salaries of nursing staff in Egypt are low.

As regard working departments, the results of the current study revealed that three fifths of both study and control groups were working in surgical units. This finding was in line with **Suliman, (2018)**, and **Almaghrabi, & Alsharif, (2021)**, who reported that the majority of studied nurses were working in surgical units. While, this results disagreed with **Gilchrist, & Pokorná, (2021)**, who stated that the majority of study participants were worked in general ward. From the researcher's point of view; nurses who work in surgical unit are high risk to back pain because of the demands of close monitoring and observation of patients and necessity of managing technological life support equipment for severely ill patients.

Concerning years of work experience, the current study represented that, more than one half of study group and two fifths of the control group were experienced from 1 to less than 10 years. This results similarly study done by **Feldman, (2021)**, and **Almaghrabi, & Alsharif, (2021)**, who stated that the majority of study participants have work experience less than ten years. However, these results were not congruent with **Gilchrist, & Pokorná, (2021)**, who found that the nursing experience more than ten years. This may be due to

most of studied nurses were enrolled in nursing diploma programs and get to work earlier because of discontinuation of educational way.

Regarding to numbers of working hours per week, it was noticed that the majority of studied nurses were working <48 hours per week. This finding come to an agreement with **Alziyadi, Elgezery, & Alziyadi, (2021)**, who supposed that the average hours of nurse's work per week was 48 hours. However, this results were not congruent with **Almaghrabi & Alsharif, (2021)**, who found that the majority of studied nurse were working more than 48 hours per week. This may be due to the official working hours in Egypt 48hrs per week.

Regarding to standing hours during work, it was noticed that more than one half of both groups study and control were standing from 3 hrs. – 6 hrs. This finding agrees with **Jan et al., (2021)**, who supposed that studied nurses were standing during work from 2 hrs -7 hrs. This may be due to shortage of staff and increase needs of patients during shift.

Concerning the training to use body mechanics, it was noticed that the majority of studied nurse hadn't trained to use body mechanics. This finding agrees with **Kamalruzaman, Sabri, & Isa, (2021)**, who said that most of studied subjects hadn't trained to use body mechanics. This may as a result from the relationship that found in many researches between back pain with nursing activities and the use of body mechanics among nurses working in hospitals as most studied nurse suffered from advanced degree of back pain.

Regarding to receiving health teaching to reduce back pain, most studied nurse didn't receive health teaching to reduce back pain. This finding agrees with **Güne, & Ayaz Alkaya, (2022)**, who stated that the nurses also don't receive health teaching to reduce back pain. As health education for chronic back pain may be effective in increasing knowledge about prevention and reduction of chronic back pain in health caregivers and cleaning workers.

Regarding quality of life physical health dimension among studied nurses, the current study noticed that there was no statistically significant difference between both study and control groups pre applying acupressure sessions. While, there was a significant statistical difference between them study and control groups post (3rd week) applying acupressure sessions. The current study supported by study done by **Kazemi, Tavafian, Hiller, Hidarnia, & Montazeri, (2021)**, who showed that the quality of life was worse with chronic back pain

and there was no statistically significant difference between groups pre acupressure sessions. This may be due to the fact that chronic back pain is often has behavioral symptoms, including fatigue, intensifies pain and reduces quality of life. (Saravanan, et al., 2021).

The current study revealed that there was no statistically significant difference between both study and control groups pre acupressure sessions in relation to psychological and emotional feeling domain. This result is in line with Mehdiavaz, & Fakhari, (2022), who reported that pain drawing as a screening tool for anxiety, depression and reduced health-related quality of life and patients with back pain experience fear from pain in the future and worry about side effects of medications.

And there was a significant statistical difference between both groups post applying acupressure sessions regarding psychological and emotional health domains. The current study similarly, study done by Cho, Joo, Kim, & Sok, (2021), who stated that there was a significant difference between both groups post applying acupressure sessions regarding psychological domains.

The current study revealed that there was no statistically significant difference between both study and control groups pre acupressure sessions in relation to social domain. And also showed that there was highly statistically significant improvement between both groups regarding social domain post acupressure sessions, Whereas, there was no statistically significant improvement in control group. This result is in line with Iguti, Guimarães, & Barros, (2021), who indicated that nurses with back pain experience from limited support from others, limited acceptance from others and limited social activities ahead of time. And Study done by Sharaf, A. Y., Syam, N. M., & Ahmed, R. F. (2020), who found that the majority of the studied nurses had poor QOL in social domain pre interventions.

In relation to environmental health domain. Moreover, there was statistically significant improvement in study group, whereas, there was no statistically significant improvement in control group. This result is in line with, Unver, Nacar, & Tashan, (2021), and Woon, et al., (2021), who indicated that nurses with back pain experience decrease feeling of safety and security, decrease opportunities to spend leisure time and suffer from change of employment more than other people.

In relation to pain intensity among studied nurses with chronic back pain, the present study

revealed that there was no statistically significant difference between study and the control groups pre first acupressure session. This result agrees with Chen, Wu, Wang, Wu, & Ren, (2021), who stated that there was low certainty of a small effect at the end of intervention for CBP intensity. These finding denote that their acupressure sessions are not enough to reach to subtle and cumulative acupressure effect whilst, three sessions or more are needed to give cumulative effect. It is worth to mentioning that cumulative effect of regular acupressure means that less tension likely to build up between acupressure sessions so, that subsequent acupressure can be deeper, more effective and benefits longer lasting. This may be attributed to the fact that nurses on both groups are relatively similar due to the age, length of working experience and numbers of working hours per week, so both groups exposed nearly to the same degree of disruption that these treatments cause.

This results similarly, study done by Cheng, Shieh, Wu, & Cheng, (2020), that found significantly lower levels of CBP intensity. While, this study Dissimilarly with Gönenç, & Terzioğlu, (2020), who stated that the study indicate that the dual application of massage and acupressure is relatively more effective than either therapy applied alone and that massage is more effective than acupressure.

Regarding Japanese Orthopedic Association Back Pain Evaluation Questionnaire (JOABPEQ), There were no significant statistical differences between groups pre applying acupressure sessions regarding low back pain, lumber function, walking ability, social life function, mental health. While, there was a significant statistical difference between them post acupressure. This finding is consistent with Ohyama, et al., (2021), who stated that the JOABPEQ is effective to measure the quality of life of patients who suffer low back disorders. As well as, there was a significant statistical difference between pre acupressure and post acupressure in the study group regarding low back pain, lumber function, walking ability, social life function, mental health. This can be attributed to the healing effect of acupressure which is holistic, involving both relaxing the body and calming the mind and regulating emotions. According to Traditional Chinese Medicine (TCM), Qi stagnation, mental fatigue, and spirit scattering essence- cultivating and spirit focusing can balance Yin and Yang (Varallo, et al., 2021). On the other hand, according to western medicine, anxiolytic effect of acupoints stimulation results in release of noradrenalin which has an anxiolytic and

antidepressant effect (Almaghrabi & Alsharif, 2021).

From the foregoing discussion, it was clear that acupressure is the best to reduce back pain and increase QOL for studied nurses. In order to help nurses with back pain to develop a sense of control over their pain, and empower their functional abilities, improve quality of life and use of collaborative approach of pain management that stress joint effort and enhance communication among health care team should be used. The findings contributed to a better understanding acupressure recognition of back pain triggers and the assessment of massage as possible future treatment for nurses.

Conclusion

Based on the results of this study, it can be concluded that acupressure at specific point is successful in reducing chronic back pain and improving QOL for nurses.

Recommendations

Educational nursing program about effect and technique of acupressure should be conducted.

Further experiments with large sample size and include all hospitals at M.U and more follow up sessions are required to obtain more generalized findings.

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