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 - (a) Research papers that move away from orthodoxy and which really break new grounds in terms of methodology and findings.
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In this edition, eighteen (18) manuscripts scale through the eye of the needle of the Editor-in Chief. The title of the papers in this edition are: effect of cold compress on the reduction of musculoskeletal pain, swelling and hemarthrosis among orthopaedic patients in Lautech Teaching Hospital, Ogbomoso, Oyo State, Nigeria; Awareness of Prostate Cancer Screening Among Male Civil Servants In Egor Local Government Area, Edo State, Nigeria; Knowledge, Perception And Utilization Of Maternal And Child Health Care Among Women In Ogbomosho, Oyo State, Nigeria; Assessment Of Knowledge And Utilization Of Electronic Medical Records Among Nurses In Secondary Health Care Facilities In Jigawa State, Nigeria; Effect Of Midwife Led Educational Intervention On Knowledge Of Anaemia And Risk Factors Among Pregnant Women Attending Ante-Natal In Selected Primary Health Care Facilities In Osun State, Nigeria; Knowledge Of Health Implications Of Rape And Associated Factors Among Male Undergraduates In Ahmadu Bello University Zaria, Nigeria; Effectiveness Of Family Caregivers Centered Nursing On Knowledge Of Pressure Ulcer Prevention In A Tertiary Health Facility In Kano, Nigeria; Knowledge And Practice Of Malaria Prevention Among Expectant Mothers In Selected Primary Health Centers In Mushin Local Government Area, Lagos State, Nigeria; Prevalence Of Sexual And Psychological Abuse In Almajiri System Of Education In Zaria Local Government Area, Kaduna State, Nigeria; Assessment Of Male Involvement In Maternity Care In Selected Health Facilities In Ado Ekiti, Ekiti State, Nigeria; Educational Intervention On Knowledge Of Prevention And Self-Care Practices Of Selected Lifestyle Diseases Among Civil Servants In State Secretariat Oke-Mosan, Abeokuta Ogun-State, Nigeria; Nursing In An Age Of Change In Nigeria; Knee Replacement Surgery: The Role Of The Nurse In Patient Safety In The Operating Room, The Nigerian Perspective; Choice Of Places Of Delivery Among Women Attending Ante Natal Clinic At Ngwo Health Centre; Systematic Review On Adolescent Girls' Knowledge And Practice Of Menstrual Hygiene In Nigeria; Knowledge And Prevention Of Hypertension Among Patients Attending Medical Outpatient Department Of Garki Hospital, Abuja, Federal Capital Territory, Nigeria And Socio-Cultural Factors Influencing Nutritional Status In Under-Five Children In Akure North Local Government, Ondo State, Nigeria.

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EFFECT OF COLD COMPRESS ON THE REDUCTION OF MUSCULOSKELETAL PAIN, SWELLING AND HEMARTHROSIS AMONG ORTHOPAEDIC PATIENTS IN LAUTECH TEACHING HOSPITAL, OGBOMOSO, OYO STATE, NIGERIA

BIDMUS, LATEEF IYANDA

ABSTRACT

Musculoskeletal injury can be as result of trauma or disease which is common these days in our communities. This study assessed effect of cold compress towards the reduction of acute musculoskeletal pain, swelling, hemarthrosis among orthopedic patients at LAUTECH hospital, Ogbomoso. Quasi-experimental design was adopted for this study. The target populations were orthopaedic patients attended Lautech Teaching Hospital, Ogbomoso. Simple random sampling technique was used to select 100 respondents out of population. The instruments used for this study were questionnaires, However, ice block and towel was used for the procedure. (Cold Compress) Measurement was made with Tape rule to measure the severity of swelling and interview and Numerical numbering pain scoring scale of 0 (minimum) to 10 (maximum) was used to measure the pain intensity pre and post the procedure, 0 means no pain and 10 means severe pain. Data was analyzed using descriptive statistical package for social scientists (SPSS) version20, 0 expressed in form of Tables, frequency charts, percentages and correlation. The demographic characteristics of this study observed that majority of the respondents were males (63%), married (65%) and living in urban areas (72%). Result also indicates that majority of the respondents are from Yoruba ethnic group (73%) and are dark skinned (56%). The age of respondents with musculoskeletal injury/disorders injury/disorders as noted in the study are as follows: Knee osteoarthritis above years 50(18%), Low back pain, above years 50(18%) and dislocation, sprain/stain including fracture are below 50 years (64%). Findings of this study after post test revealed that there is effectiveness of cold compress on the reduction of acute musculoskeletal pain, from 7.5/10 to 1.5/10. Also, there is effectiveness of cold compress on

the reduction of swollen ankle/elbow/knee joints is, from 7 cm to 2cm and lastly, there is effectiveness of cold compress on the reduction of swelling, tensed, tenderness, severe pain among respondents with hemoarthrosis within 36 hours of cold therapy application without NSAIDs. The result of hypotheses in this study observed that there is no significant relationship between respondents exposed to cold compress in the course of management of acute musculoskeletal swelling, and the ages of the respondents. Secondly, there is no significant relationship between respondents exposed to cold compress in the course of management of acute musculoskeletal pain, and the genders. Thirdly, there is no significant relationship between respondents exposed to cold compress in the course of management of acute musculoskeletal hemarthrosis and the respondents' ethnicities. Lastly, there is significant effect relationship between the respondents exposed to cold compress and reduction of acute musculoskeletal pain. The hypothesis was to know whether gender, age, and ethnicity of respondents affect the result of cold compress, results showed that age, gender, and ethnicity has no inhibitory effect on cold therapy effectiveness. Cold items must not be placed directly to the skin to prevent frost bite or cold burn but wrap the ice cubes or other cold in a thin cloth, then apply it to the injured site gently for maximum of 20 minutes intermittently for 4 to 6 times within 24hours. In conclusion, Acute musculoskeletal pain, swelling and hemarthrosis were effectively managed with cold compression therapy instead of introducing patients to OPIOIDS or NSAIDs drugs which can be addicted or cause drug induced gastric ulcer.

Keywords: Musculoskeletal Pain; Hemarthrosis; Coldcompress; Othopaedicpatients.

INTRODUCTION

Musculoskeletal injury is a destruction or trauma that affects the bones, muscles, ligaments, nerves, or tendons resulting to pain, swelling, and redness with or without hemarthrosis. Musculoskeletal injuries (MSIs) are referred to varieties of names which include repetitive strain injuries (RSIs), repetitive motion injuries, cumulative trauma disorders (CTDs), and work-related upper limb disorders (WRULDs) and others. In each case, the name is used to describe injuries of the bones, joints, ligaments, tendons, muscle and other soft tissues. (Ejelle, & Hagberg 2018). Musculoskeletal Disorders (MSDs) are diseases affecting the musculoskeletal system and human body's movement of musculoskeletal system i.e. muscles, bone, tendons, ligaments and the surrounding nerves. Musculoskeletal injuries or disorders usually cause pain and swelling.

Musculoskeletal pain is a non-pleasant sensation felt as a result of irritation or pressure to nerve endings of the part of the bone and the surrounding soft tissues affected. In other words, musculoskeletal pain is an acute or chronic pain that affects bones, muscles, ligaments, tendons, and even nerves. The pain associated with musculoskeletal disorders/injuries is a common medical and socio-economic problem worldwide (orthopaedic Associations of St. Augustine 2022). The major causes of musculoskeletal pain, swelling, hemarthrosis are Fracture, Dislocation, Cancer of the bone, Wounds (cellulites), Amputation, Infection (Arthritis, rheumatoid arthritis), Trauma, Sprain, Strain, Surgical intervention, Sport injury, Intra-articular, intrabursal, intramuscular, hemarthrosis. Other conditions that can cause muscle and bone pain are Lumbar-Sacral Slips Disc, Sciatica, Injection Abscess, Scorpion bite, Whitlow etc

Musculoskeletal pain (MSP) is a great global problem in working populations and has economic consequences on an .The International Association for the Study of Pain (IASP), (2018) defines pain as an unpleasant

sensory and emotional experience associated with actual or potential tissue damage, or described in as damage. Pain is subjective.” (De Vries et al., 2011).

Clinical practice guidelines for pain management in acute musculoskeletal injury present evidence-based best practice recommendations for the management of musculoskeletal injury with the hope that they can be utilized by orthopedic practices and other specialties to improve the management of acute pain following musculoskeletal injury by (Hsu et al., 2019). There are recommendations presented regarding pain management which are cognitive strategies, physical strategies, strategies for patient on long term opioids administration at presentation to health care center, and system implementation strategies. They recommended the use of multimodal analgesia, prescribing the lowest effective immediate – release opioid for a short period of possible, and considering regional anesthesia. They also recommended connecting patient to psychosocial interventions as indicated and considering anxiety reduction strategies such as aromatherapy, finding physical strategies including Ice, elevation, and transcutaneous electrical stimulations. Long term use of NSAIDs, OPIOIDS at presentation should be limited. Therefore, opioid and NSAIDs education by prescribers to patient is necessary and the emphasis on the significant of physical strategies for the management of musculoskeletal injury. However, Cold compression therapy is a combination of cryotherapy and static compression commonly used for the treatment of pain and inflammation after acute injury or surgical procedures.. Cryotherapy is the use of ice or cold in a therapeutic setting. This has become one of the most common treatments in orthopaedic medicine. Effects of cold compress cause skin vasoconstriction, and if a cold compress covers a large area of the body, a significant amount of blood will be driven into the internal organs. Prolonged cold causes a secondary hydrostatic effect after 3–5 minutes, inducing vasodilatation of the surface skin blood

vessels. This secondary effect, referred to as a reaction, is of significant therapeutic Cold compression therapy is a combination of cryotherapy and static compression commonly used for the treatment of pain and inflammation after acute injury or surgical procedures.. Cryotherapy is the use of ice or cold in a therapeutic setting. This has become one of the most common treatments in orthopaedic medicine. importance in naturopathic hydrotherapy. The reaction, or dynamic circulatory response in response to physiological stress, is analogous to the adaptive response of the body to physical exercise. It is a culmination of neurological vasomotor activity mediated via the smooth muscles embedded within the circulatory system. The method of cold-water application in naturopathic hydrotherapy(that is the application of water as a healing method), particularly the cold wet pack, exercises this neuromuscular response over time with a constitutional benefit to the organism (Lin et al., 2014).The current statistical data shows that globally 39% of people daily affected with acute musculoskeletal injuries and in Nigeria it is 22% . Over 37.5% of Orthopaedic treatment modalities have been affected with uncontrolled inflammatory swelling.

A Cardinal responsibility in Nursing is to provide comfort and relieve distress. Therefore one of the non-pharmacological methods that can be used to reduce swelling, pain, hemarthrosis is Ice or cold application. The use of cold for reducing swelling and pain is a practice dating from the time of Hippocrates in the 4th century BC. Ice was also used as an anesthetic agent in middle ages. Cold therapy in the forms of ice bags has been extensively used in athletic training since 1960s. It is thought to act as an anti-inflammatory agent by reflex vasoconstriction. When ice applied to the surface of the skin the initial response is vasoconstriction of superficial blood vessels. If skin temperature is sufficiently lowered the cooler temperature stimulates free nerve ending which in turn causes numbness. After the short period there follows a vasodilatation

due to axon reflex, this phenomenon is called as hunting response. (Karch, 2015). Acute musculoskeletal injured patients are usually exposed to OPIOIDS or non steroidal anti inflammatory drugs (NSAIDs) which may be addicted by the users or cause gastric ulcer after medical management. OPIOIDS (narcotic) are Pentaxozin, Tramadol, morphine etc, NSAIDs are Diclofenac, Chymoral, ibuprofen etc. To avoid the complications that may result from intake of OPIOIDS or NSAIDs, another means of management of acute musculoskeletal injury must be determined to be used instead OPIOIDS or NSAIDs usage. Hence, this study on the effect of cold compress on the reduction of musculoskeletal pain, swelling and hemarthrosis among orthopaedic patients in Lautech Teaching Hospital, Ogbomoso.

Objective of the Study

Broad Objective of the study

To determine the effect of cold compress on the management of acute musculoskeletal pain, swelling and hemarthrosis. among orthopaedic patients in Lautech Teaching Hospital, Ogbomoso.

Specific Objectives are to

1. assess the level of musculoskeletal pain among orthopaedic patients in Lautech Teaching Hospital, Ogbomoso pre and post test.
2. determine the level of swelling among orthopaedic patients in Lautech Teaching Hospital, Ogbomoso pre and post test.
3. assess the hemarthrosis level among orthopaedic patients in Lautech Teaching Hospital, Ogbomoso pre and post test.

1.8 Hypotheses

1. **Ho-** There will be no significant relationship difference between respondents exposed to cold compress in the management of acute musculoskeletal swelling and their ages at LTH, Ogbomoso

2. **Ho-** There will be no significant relationship difference between respondents exposed to cold compress in the management of musculoskeletal pain, and their genders at LTH, Ogbomoso
3. **Ho-** There will be no significant relationship difference between respondents of acute musculoskeletal hemarthrosis exposed to cold compress and their ethnicity at LTH, Ogbomoso.
4. **Hi-** There will be a significant effect relationship between the respondents exposed to cold compress and reduction of acute musculoskeletal pain and swelling

METHODOLOGY

Research Design: The study adapted Quasi Experimental design in which the same respondents (single group) served as both control and experimental group (pre and post experiential design). This design was adapted because of paucity of respondents.

Research Setting: The location of the study is LAUTECH Teaching Hospital, Ogbomoso. LAUTECH Teaching Hospital was established and commissioned by his Excellence former governor of Oyo State, a person of Otunba (Dr) Christopher Alao Akala on 20 of Mach 2011. The hospital was a partner to the former LAUTECH Teaching Hospital Osogbo now known as UNIOSUN Teaching Hospital when Oyo and Osun States were jointly owing Ladoke Akintola University Of Technology, Ogbomoso before it was separated by memorandum of understanding between Governor Adegboyega Oyetola and Governor Olumakinde Oluwaseyi of Osun and Oyo States respectively in the year 2020. LAUTECH Teaching Hospital is located in Ogbomoso North Local Government Area of Ogbomoso city. LAUTECH Teaching hospital is situated at Oke Ado Area, Isale general, along Ilorin road.

Population of the Study: The target population for this study were Orthopedic patients admitted to Accident and Emergency unit and orthopaedic wards of Ladoke Akintola University of Technology Ogbomoso, of

patients with musculoskeletal pain or musculoskeletal swelling or musculoskeletal hemarthrosis from musculoskeletal diseases and injuries like ankle sprain, ankle strain, ankle dislocation, close fractured patients, low back pain, Arthritis, Sport injury, intramuscular hemarthrosis, intrabursal hemarthrosis, and any case of musculoskeletal pain, hemarthrosis and swelling admitted during the course of 10 weeks of the study. Total Population is 200 patients.

Inclusion Criteria: Patients with Musculoskeletal injuries or musculoskeletal disorder on admission in accident and Emergency unit and orthopaedic wards admitted within the period of the study.

Exclusion Criteria: patient without musculoskeletal injuries or Musculoskeletal diseases and patient with musculoskeletal injuries with impaired skin integrity eg wound, numbness, superficial burns, and other vascular complications like varicose vein that are contraindicated to cold compress.

Sample size determination: The minimum sample size was determined using the Taro Yamane formula of 1967:

$$n = \frac{N}{1 + N(e)^2}$$

Where

n = Signifies the sample size

N = Signifies the population under study

e = Signifies the margin error

$$n = \frac{200}{1 + 200(0.05)^2}$$

$$n = \frac{200}{1 + 200(0.0025)}$$

$$n = \frac{200}{1 + 1} \quad n = \frac{200}{2}$$

$$n = 100 \text{ (target population)}$$

Sampling Technique

The sampling technique that was employed in this study is simple random sampling technique to select a sample size of 100 patients from the total population of 200 patients

Instrument for Data Collection:

The data for pain category was collected by the use of interview and pain numerical Rating Scale (NRS) of 1 to 10. Questionnaire was used

to record reductions in swelling and hemarthrosis at a point in time and physical examination and tape rule was used to measure swelling reduction during the procedure

Validity of the Study

The questionnaire was validated by the ethical committee LAUTECH teaching hospital and supervisor and other experts that went through it and made corrections and recommendations. The researcher corrected the contents based on the recommendations.

Reliability of the Instrument

Modify The reliability of the research instrument is the extent to which the instrument yields the same results on repeated trials. The reliability of the instrument was statistically determined using 10 percent of the total sample for pilot study. Ten copies of the instruments were administered to 10 patients within 72 hours of admission in Bowen Teaching Hospital Ogbomosho Oyo State. The result was collected and analyzed using Spearman Brown correlation analysis method. The result of the co-efficient of validity was 0.91 indicating the reliability of the instruments as predicted reliability of Spearman Brown using Spearman-Brown prophecy formula

Pilot study

The pilot study was carried out in Bowen Teaching Hospital, Ogbomosho, Oyo State

where 10 patients were used pre and post study to practice cold compress procedure for smooth running of the main study

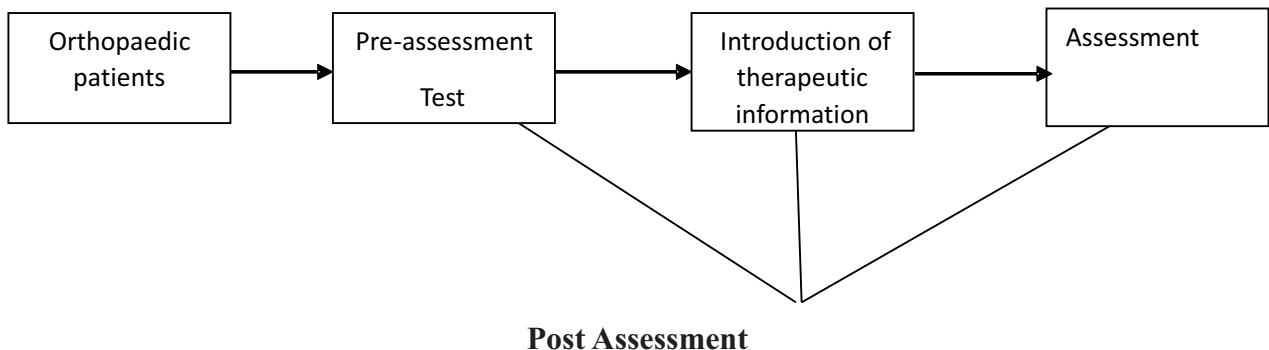
The purpose of the pilot study was to determine the feasibility of the research study and the workability of the instruments, the length of the time to administer the instrument and to make necessary corrections before it was administered to the respondents during the main study.

Method of Data Collection

A letter of introduction was collected from the Faculty of Nursing Science, Ladoke Akintola University of Technology and same was given to hospital authority and consent was granted by the hospital authority and respondent patients.

Modify The interview was carried out by the researcher and the researcher assistants on each of the respondents with pain, swelling and hemoarthrosis pre and post procedure and the score of individual respondent were marked on the questionnaires, questionnaires is where time frames, numbers, genders, age, ethnicity, musculoskeletal symptoms and other relevant data were organised. Questionnaires were filled for respondents by researcher and his assistants based on his/her observations for 10weeks and the questionnaires were collected and collated immediately after the tests. 100 respondents (single group) had both pre and post cold compress procedure accorded

Fig. 1: The process of cold compression procedure



The chart above (Fig. 1) illustrate the process of cold compression procedure

Orthopedic Patients were the respondents, 100 respondents were randomly selected. Procedure was explained to them individually and they were counseled about the mission and the benefits of the study. Research instruments such as Tape rule, hand gloves, Questionnaires, pen, and cold compress materials such as ice packs, bandages, Towels, Cooler, Freezer were made readily available. Patient's privacy was secured. Respondent's consents were gained and they were ready for the cold compress procedures. Numerical numbering pain scoring scale of 0 (minimum) to 10 (maximum) was used to measure the pain intensity by interview and observations pre, during and post procedure, 0 means no pain and 10 means severe pain. The time and number of days of the procedure depends on the case conditions and severity of the pain, swelling and hemarthrosis.

Pre- assessment; the respondents were nursed in prone and supine positions with adequate privacy. The positions used depend on the part of injuries. Patients with low back pain had cold compress procedure done in prone position while those with lower and upper limbs had in supine and lateral positions with adequate privacy. The respondent's pain level was scored and documented on questionnaires individually. Tape rule was used to measure the sizes of swelling and the values were ticked on the questionnaires individually. The swollen legs and hemoarthrosed joints were measured before, during and after cold compression therapy.

Introduction of therapeutic information; The procedure materials were made ready and made available to the hospital premises including a freezer, ice cubes, ice packs, flannels, bandages, hand gloves, coolers, ice carriers, Questionnaires and research assistants before the time of the study and made available through the time of the study.

Procedure; The procedure then started and carried out on the affected part of patient's body individually and subsequently. Ice pack wrapped around the affected part(s) with piece

of cloth or flannel and held in position with bandage gently for about 10 to 15 minutes, maximum of 20minutes and turned around the part injured in circular motion to encourage blood circulations for 3 to 4 times per day up to 1, 2, 3days after gaining the patient's consent. The time and number of days of the procedure depends on the case conditions and severity of the pain, swelling and hemarthrosis. The ice pack must be wrapped with a flannel before application to the skin to prevent frost bite and should not stay long on the patient body to prevent frost skin burn and skin damage.

Post assessments; the materials used for cold compress were removed from patients side, patients environments were tidy up and patients were made comfortable. The swollen legs were measured after the cold compression therapy to determine the cold therapy effect within 24 to 72 hours intermittently. Hemarthrosed joints were also observed post experimentally. Remarkable healthy conditions were recorded

Nurses, Doctors, research assistants, patients and their relatives, ward maids, porters etc were appreciated. The data was collated and presented using frequency distribution tables, graphs and charts. Variables were measured using Chi-square and continuous variables using T-test. Statistical significance was determined at $P < 0.05$. . Data was analyzed using the descriptive Statistical Package for Social Scientists (SPSS) version 20.0 with the generation of frequency tables. The results were reported and recommendations were made.

Result: Musculoskeletal pain took 24 hours to subside. Few of musculoskeletal swelling subsided at 24hours of cryotherapy, Some subsided at 48 hours of cryotherapy while most musculoskeletal swelling subsided at 72hours of cryotherapy with moderate elevation especially severe cases. All hemarthrosed joints subsided within 48hours of cyotherapy. Tape rule was used to measure the size of swelling compared to the non-affected unilateral part of the body of the victim to determine the size reduction during and after the procedures. The obvious signs and symptoms of hemarthrosed joints were

observed and noted for justifications before and after cold compress procedures.

Managing team was involved in the research work of cold compress procedure for cooperation and to withhold NSAIDs and OPIOID for the selected patients.

Data Analysis The data was collected with the aid of in-depth interview, close observations and questionnaires adapted from the work of Olugbenga-Bello et al (2013) and Roberfroidetal (2017),

The questionnaires were held by researcher and trained research assistants to be marked after exclusive interview of respondents before and after cold compression therapy.

The filled questionnaires (pre and post-tests questionnaires) were collated by the researcher, research assistants and analyzed. The questionnaires were manually checked for

errors and the data was analyzed using the descriptive Statistical Package for Social Scientists (SPSS) version 20.0 with the generation of frequency tables.

The data was presented using frequency distribution tables, graphs and charts. Variables were measured using Chi-square and continuous variables using T-test. Statistical significance was determined at $P < 0.05$.

Ethical consideration

Letter of introduction was collected from Faculty of Nursing Science, Ladoke Akintola University of Technology, Ogbomoso, and was submitted with an application letter for ethical approval to the ethical committees which was addressed to the chairman ethical committees, LAUTECH Teaching Hospital, Ogbomoso with three copies of the research proposal. The approval was granted after corrections has been made

Activities of research work and time duration

1, Distribution of informed consent to respondents	1 week
2, Introduction and distribution of instruments to be used	1 week
3, Research assessment procedures and collation of data	8 Weeks

RESULTS

Table1 illustrates the demographical distribution of respondents including ages, sex, marital status, locations and ethnicity. The results indicated that 63(63%) of 100 respondents are male while 37(37%) are female. 65(65%) are married while 27(27%) are single, 8 (8%) are widows and nil divorcee. People living in urban are 72(72%), 13(13%) were from semi-urban area while those in rural area were just 15(15 %). 73(73%) of the respondents are Yoruba, 8(8%) are Hausa,

12(12%) are Igbo, 4(4%) are Egede while 3(3%) are Tiv. The respondents selected are not of the same skin complexion. 56 (56%) of the 100 respondents are dark in complexion while the remaining 44 (44%) are light in complexion. The demographic characteristics of this study observed that majority of the respondents we, re males (63%), married (65%) and living in urban areas (72%). Result also indicates that majority of the respondents are from Yoruba ethnic group (73%) and are dark skinned (56%).

Table 1. showing the demographic distribution of the respondents

Gender	Frequency	Percentage
Male	63	63%
Female	37	37%
Total	100	100%
Marital status		
Married	65	65%
Single	27	27%
Widow	8	8%
Divorce	0	0%
Total	100	100%
Geographical location		
Urban area	72	72%
Semi – urban	13	13%
Rural area	15	15%
Total	100	100%
Ethnicity Distribution of the respondents		
Yoruba	73	73%
Hausa	8	8%
Igbo	12	12%
Egede	4	4%
Total	100	100%

Skin complexion of the respondents

Skin complexion	Frequency	Percentage
Dark skin	56	56%
Light skin	44	44%
Total	100	100%

Table 2 shows age distribution of respondents with musculoskeletal injury and site of injury; revealed that 18 (18%) respondents with Osteoarthritis are above 50year and 18 (18%) respondents with low back pain are also above 50 years of age respectively.64 (64%) respondents that had dislocation, sprain/strain and fracture were below 50years of age. The result implies that (64) 64% of the respondents are below 50 years of age and 36 (36%) are above 50year.Respondents with upper

extremities are 6(6%) of 100 respondents, Lower extremities are 76 (76%) of 100 respondents while those of spine region diseases are 18 (18%). The age of respondents with musculoskeletal injury/disorders injury/disorders as noted in the study are as follows: Knee osteoarthritis above years 50(18%), Low back pain, above years 50(18%) a n d Dislocation, sprain/stain and fracture Below 50 years (64%)

Table 2: Age of respondents with musculoskeletal injury/disorders

Cases	Age	Frequency	Percentage
Knee osteoarthritis	• Above 50 years	18	18%
	• Between 50 and 60 years	7	
	• Between 60 and 70 years	8	
	• 70 years and above	3	
Low back pain	• Above 50 years	18	18%
	• Between 50 and 60 years	6	
	• Between 60 and 70 years	9	
	• Above 70 years	3	
Dislocation, sprain/stain and fracture	• Below 50 years	64	64%
	• Between 20 and 30 years	20	
	• Between 30 and 40 years	21	
	• Below 20 years	23	
Total		100	100%

Table 3 described the results of the level of acute musculoskeletal pain, among orthopaedic patients pre and post intervention. The pain rating scale value and at the pre-intervention stage is 6 to 9 over 10 at average pain threshold is 7.5/10. Post-intervention, the pain rating

value reduction was 1.5/10 after 24hours of application of cold compress. Thus, findings revealed that there is effectiveness of cold compress on the reduction of acute musculoskeletal pain, from 7.5/10 to 1.5/10

Table 3: Descriptive analysis of the level of musculoskeletal pain among orthopaedic patients pre and post intervention

Test	Items	measured values and signs and symptoms	Percent	Ave. Pain threshold
Pre-intervention	6 to 9 over10, 0f pain rating scale value before cold therapy.	24 respondents scored 6/10,	24%	7.5/10
		32 respondents scored 7/10,	32%	
		20 respondents scored 8/10,	20%	
		24 respondents scored 9/10.	24%	
Post-intervention	1 to 2 over10 pain rating value reduction after 24hours of application of cold compress without OPOAID or NSAIDs administration.	53 respondents reduced to 1/10	53%	1.5 /10
		47 reduced to 2/10 of numeral pain rating scale	47%	

Figure 2a: Chart illustration of the respondent’s signs and symptoms of musculoskeletal

Injury/ disorder	Frequency	percentage
Acute musculoskeletal pain	100	(100%)
Acute musculoskeletal pain with swelling	82	(82%)
Acute musculoskeletal pain without swelling	18	(18%)
Acute musculoskeletal Pain with swelling and Hemarthrosis	32	(39%)
Acute musculoskeletal pain with swelling without hemarthrosis	50	(61%)

Figure 2b:

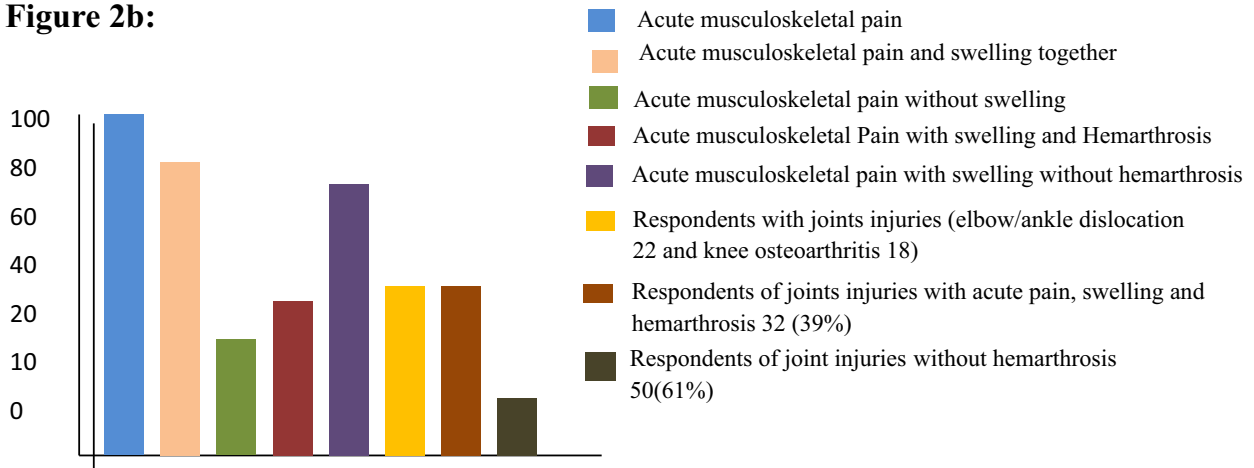


Table 4 below illustrates the cases of the respondents selected for the study according to their gender. This result revealed that male 14 (14%) had ankle dislocation, female 2 (2%) had ankle dislocation making a total of 16 (16%) respondents with ankle dislocation. 5(5%) male respondents had elbow dislocation, female 1(1%), had elbow dislocation, making total of 6 (6%) respondents with elbow dislocations. 22 (22%) respondents had dislocation in total. Moreover, 16 male (16%) and 4 female (4%) had close fracture, making 20 (20%) respondents with fracture cases. Furthermore, 18 (18%) of 100 respondents had low back pain, 15(83.7%) are male while

3(16.3%) are female. Also, 22 (22%) of 100 respondents that had sprain and strain, 20 (92%) of them are male while 2 (8%) are female. 18(18%) of 100 respondents had knee osteoarthritis out of which 5 (27.3%) are male and 13 (72.7%) others are female. Therefore, 22(22%) of 100 respondents had joints dislocations and 18 (18%) of 100 respondents had osteoarthritis of knee joint, making 40 (40%) respondents with joint injuries. 32 (80%) of 40 respondents with joints injury had musculoskeletal pain, swelling and hemarthrosis while the remaining 8(20%) had musculoskeletal pain and swelling alone without hemarthrosis.

Table 4: Orthopaedic cases of respondents with sex variance selected for the study

Cases	Gender		Frequency		Total (%)
	Male	Female	Male	Female	
Ankle Dislocation	14	14%	2	2%	16 (16%)
Elbow Dislocation	5	5%	1	1%	6 (6%)
Close fracture	16	16%	4	4%	20 (20%)
Low back pain	15	15%	3	3%	18 (18%)
Sprain	16	16%	1	1%	22 (22%)
/strain	4	4%	1	1%	
Knee Osteoarthritis	5	5%	13	13%	18 (18%)
Total	75	75%	25	25%	100 (100%)

Table 5 reveals the results of the level of swollen ankle/elbow/knee joints, among orthopaedic patients pre and post intervention. The analysis examines swollen ankle/elbow/knee joints. During the pre-intervention, the respondents swollen ankle/elbow/knee joints is up to 7cm to 9cm

increments. Post-intervention, the rating value reduction was 5cm at 24hours of application of cold compress, and 6cm reduction at 48hours. Thus, findings revealed that there is effectiveness of cold compress on the reduction of swollen ankle/elbow/knee joints is, from 7 cm to 5cm.

Table 5: Descriptive analysis of the level of swollen ankle/elbow/knee joints, among orthopaedic patients pre and post intervention

Test	Items	Measured Values and Signs And Symptoms	Percent	Ave. swollen cm
Pre-intervention	6 to 9cm size increment compared to normal part depends on severity and individual.	28 increased by 6cm,	28%	7cm
		34 increased by 7cm,	34%	
		30 increased by 8cm.	30%	
		other 8 increased by 9cm	8	
Post-intervention	4 to 6cm of swelling reduction within 72hours of cold therapy application without NSAIDs.	30 respondents reduced by 4cm,	30%	5cm
		36 respondents reduced by 5cm	36%	
		34 respondents reduced by 6cm	34%	

Table 6 indicate that the analysis of Hemoarthrosis level among orthopaedic patients pre and post intervention. At the preintervention level, there is no reduction of swelling, tensed, tenderness, severe pain among respondents with hemoarthrosis. Thus,

findings revealed that Post-intervention, there is effectiveness of cold compress on the reduction of swelling, tensed, tenderness, severe pain among respondents with hemoarthrosis from within 36 hours of cold therapy application without NSAIDs.

Table 6: Descriptive analysis of the Hemoarthrosis level among orthopaedic patients pre and post intervention

Test	Items	measured values and signs and symptoms	Percent	Result
Pre-intervention	swelling, tensed, tenderness, severe pain	100 all the respondents	100%	No reduction
Post-intervention	The swelling, pain and tenderness reduced within 48 hours of cold compression therapy.	44respondents got reduction at 24hrs	44%	Reduction after 36hrs
		56 got reduction at 48 hours	56%	

Hypotheses

H0: There is no significant relationship 1 difference between respondents exposed to cold compress on the management of acute musculoskeletal swelling and their ages.

Result- T. test results shows the significance results of effectiveness of cold compress on the management of acute musculoskeletal swelling between the respondents and their ages.

The result in Table 7 shows that the p-value of 0.95 is greater than alpha level of 0.05; hence

the null hypothesis is accepted. Therefore, the hypothesis which stated that there is no significant difference between respondents exposed to cold compress on the management of acute musculoskeletal swelling and the ages of respondents is hereby accepted.

This implies that the ages of respondents have no hindering factors on the significant of cold compress therapy in the management of acute musculoskeletal swelling.

Table 7 Effect Between Respondents Exposed To Cold Compress On The Management Of Acute Musculoskeletal Swelling And Their Ages.

Variable	N	X	SD	DF	P-Value	Remark
Acute Musculoskeletal swelling	82	82.6	27.28	99	0.95	Rejected
Orthopaedic patients	100	75	27.38			

P<0.05.

H02: There is no significant relationship difference between respondents exposed to cold compress in the management of acute musculoskeletal pain, and their genders T-test results in table 8 shows that the p-value of 0.84 is greater than alpha level of 0.05 significance. Therefore, the hypothesis which stated that

there is no significant difference between respondents exposed to cold compress in the management of musculoskeletal pain, and their genders is hereby accepted. This Imply that, gender has no hindering factor on the significant of cold compress in the course of management of acute musculoskeletal pain.

Table 8 Relationship Between Respondents Exposed To Cold Compress In The Course Of Management Of Acute Musculoskeletal Pain, And The Genders Of Respondents.

Variable	N	X	SD	Df	P-value	Remark
Musculoskeletal pain	100	82.6	27.28	99	0.84	Rejected
Orthopaedic patients	100	75.25	30.63			

P<0.05

H03: There is no significant relationship difference between respondents of acute musculoskeletal hemarthrosis exposed to cold compress and their ethnicities at LTH, Ogbomoso

Table 9: T-test results shows the significance relationship of cold compress towards the management of acute musculoskeletal hemarthrosis between respondents exposed to

cold compress and their ethnicities, the results shows that the p-value of 0.93 is greater than alpha level of 0.05 significance. Therefore, the null hypothesis is also accepted. This implies that ethnicities or tribes has no hindering factor on the significant of cold compress in the course of management of acute musculoskeletal hemarthrosis at LAUTECH hospital, Ogbomoso

Table 9 Relationship Between Respondents Exposed To Cold Compress In The Course Of Management Of Acute Musculoskeletal Hemarthrosis And The Respondents' Ethnicities

Variable	N	X	Sd	Df	P-Value	Remark
Musculoskeletal hemarthrosis	32	82.6	27.28	99	0.93	Rejected
Orthopaedic patients	100	66.16	40.98			

P<0.05

Hi4: There will be a significant relationship between the respondent exposed to cold compress and reduction of acute musculoskeletal pain.

Table 9: T-test shows the significant relationship between respondents' exposure to cold compress and reduction of acute musculoskeletal pain at Lautech Teaching Hospital, Ogbomoso.

The results below shows that the p-value of - 0.93 is lesser than alpha level of 0.05 significant. Therefore, the alternative hypothesis is hereby accepted. This implies that there is a significant relationship between the respondents exposed to cold compress and reduction of acute musculoskeletal pain.

Table 10 Relationship Between The Respondents Exposed To Cold Compress And Reduction Of Acute Musculoskeletal Pain.

Variable	N	X	SD	Df	P-value	Remark
Musculoskeletal pain	100	82.6	27.28	99	- 0.93	Rejected
Orthopaedic patients	100	75.25	30.63			

P<0.05

DISCUSSION

This study determines the effect of cold compress on the reduction of acute musculoskeletal pain, swelling and hemarthrosis among orthopaedic patients in Lautech Teaching Hospital, Ogbomoso. The demographic characteristics of this study observed that majority of the respondents were males (63%), married (65%) and living in urban areas (72%). Result also indicates that majority of the respondents are from Yoruba ethnic group (73%) and are dark skinned (56%). The age of respondents with musculoskeletal injury/disorders as noted in the study are as follows: Knee osteoarthritis above years 50(18%), Low back pain, above years 50(18%) and Dislocation, sprain/stain and fracture Below 50 years (64%)

Findings revealed that there is effectiveness of cold compress on the reduction of acute musculoskeletal pain, from 7.5/10 to 1.5/10 . This result is supportive of the study conducted by Jon Black, Dervine et al (2015) on cold and compression in the management of musculoskeletal injury and orthopaedic operative procedure. This result is in consonance with the result from a study done which proved that cryotherapy inhibit signs of inflammation and achieve beneficial result and also proved that physiological studies indicated cryotherapy resulted in vasoconstriction, reduction of edema and diminished pain. (Gary Greenstein, (2016)

This study revealed that there is effectiveness of cold compress on the reduction of swollen ankle/elbow/knee joints is, from 7 cm to 5cm within 24hours.

This study revealed that Post-intervention, there is effectiveness of cold compress on the reduction of swelling, tension, tenderness, severe pain among respondents with hemarthrosis within 36 hours of cold therapy application without NSAIDs.

This study shows that there is no significant relationship effectiveness differences between

respondents exposed to cold compress in the course of management of acute musculoskeletal swelling, and the ages of the respondents.

This study also shows that, there is no significant relationship difference between respondents exposed to cold compress in the course of management of acute musculoskeletal pain, and the genders of respondents. This study is consistent with Block (2010) whose finding from randomised controlled trials of knee arthroplasty showed that cold compress provide better outcome.

The result of this study reveals that there is no significant relationship difference between respondents exposed to cold compress in the musculoskeletal hemarthrosis and the respondents' ethnicities at LAUTECH hospital, Ogbomoso. There is limited study on this hypothesis. This study observed that there is significant relationship between the respondents exposed to cold compress and reduction of acute musculoskeletal pain. This study is consistent with Yutan (2022) who observed that there is significant relationship between cold pack and reduction of swelling and inflammation.

CONTRIBUTION TO KNOWLEDGE

- It is better to wrap the ice cubes or other cold objects in a thin cloth and then apply it to the skin. Do not place the cold items directly on the injured site, as it can harm the external skin.
- Place the ice pack in an intermittent way to ease the pain and, at the same time, check for sensations.
- Apply cold therapy for about 20 minutes many times a day (typically 4 to 6 times in 24 hours).
- Try to apply the cold therapy over a broad six-inch area around the site of pain.
- Cold therapy is very effective when used immediately after the injury or at least between 24 to 72 hours post-injury.

- Cold therapy is an adjuvant treatment combined with other therapeutic remedies like rest (avoiding physical activities), compression (applying pressure to the injured area), elevation (to keep the injured site in a raised position), medications (painkillers and muscle relaxants), (hands-on care and patient education), and exercises (stretching and strengthening).
- Do not use cold compress on patients with impaired skin sensation as it may worsen the sensation perception
- Do not use cold compress for patient with impaired skin integrity
- Do not use cold therapy on the patient that has burns or blisters as it may cause necrosis.
- Do not use cold compress therapy on the patients with vascular complications like varicose vein to avoid thrombus embolism
- Do not use cold therapy to treat pain from a patient with open fracture, this may delay wound healing

5.4 CONCLUSION AND RECOMMENDATIONS

Cold therapy is a low cost-effective remedy to relieve pain, internal bleeding and swelling. Cold therapy items are readily available around us to be used for patients to treat closed musculoskeletal injury conservatively. This current study was employed to investigate and determined whether cold compress is effective on the reduction of acute musculoskeletal pain, swelling and hemarthrosis among orthopaedic patients in LAUTECH, Ogbomoso. Based on the objectives of this study, four research questions and hypotheses were formulated. The research questions were designed to find out if the application of cold compress can be effectively reduce musculoskeletal pain, swelling, hemarthrosis and the relationship of respondent 's genders, ages, body complexion and ethnicities to cold compress effect among Orthopaedic patients at LTH, Ogbomoso.

The hypotheses was designed to determined the significant relationship differences between the cold compression therapy and age, sex and the ethnicity of the respondents towards the management of acute musculoskeletal pain, swelling and hemarthrosis. The study adopted a pre and post experimental design which was carried out among the Orthopaedics patients in LAUTECH, Ogbomoso.

However, a sample of one-hundred (100) respondents were selected out of others to partake in this study from the study population 200 patients using Taro Yamane formula. Intensive interview, close observation and questionnaires were developed as the study instrument comprised of different items, section by sections based on the objectives of the study. Data analysis was done using simple frequency and percentage, charts and t-test statistical measurement to determine the study variables at 0.05 level of significance.

A simple frozen item from a home refrigerator wrapped in a towel will serve the purpose of cold therapy procedure. Even if a specified cold therapy product is unavailable, any simple means of ice fomentation will give a mild degree of relief and benefit the patient until definitive treatment is planned.

Application of cold compression therapy has positive effects on reduction of musculoskeletal pain without OPIODS or NSAIDs, musculoskeletal swelling without NSAIDs administration. Cold therapy reduces hemaethrosis within 48 hours with a moderate elevation without any drug. Almost without exception, the use of cold compression therapy results following either acute musculoskeletal injury or surgery improves clinical outcomes compared to no treatment. However, looking at the above results of cold compression therapy, age, sexes, ethnicity or complexion has no hindering factors in the effectiveness of cold compression therapy towards the management of signs and symptoms of acute musculoskeletal injury. .Proper and adequate practice of cold compression therapy and other

roles of nurses is advocated, counseling and education increases knowledge. Knowledge of Cold compression therapy helps to improve attitude of health workers towards utilization of cold compress therapy as a means of nonpharmaceutical and conservatory ways of management of acute musculoskeletal pain, swelling and hemarthrosis.

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