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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии

საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

GMN is indexed in MEDLINE, SCOPUS, PubMed and VINITI Russian Academy of Sciences. The full text content is available through EBSCO databases.

GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНИТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНИТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებიდან.

WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman** (**Кириллица**), для текста на грузинском языке следует использовать **AcadNusx.** Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - http://www.spinesurgery.ru/files/publish.pdf и http://www.nlm.nih.gov/bsd/uniform_requirements.html
В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректура авторам не высылается, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or compu-ter-printed on a single side of standard typing paper, with the left margin of **3** centimeters width, and **1.5** spacing between the lines, typeface - **Times New Roman** (**Cyrillic**), print size - **12** (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf
In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

Articles that Fail to Meet the Aforementioned Requirements are not Assigned to be Reviewed.

ავტორთა საყურადღებოდ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დავიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე,დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx.** შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრამების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შეღებვის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფჩხილებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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EFFECTIVENESS OF ICE APPLICATION AT SELECTED ACUPOINT (LI-4) PRIOR TO INTRAMUSCULAR INJECTION ON LEVEL OF PAIN AMONG CHILDREN IN A SELECTED HOSPITAL, CHENNAI, TAMIL NADU, INDIA

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Abstract.

Background: Immunization is an effective and safest way to prevent vaccine-preventable diseases and thereby reduce morbidity and mortality in children. Injections given for immunization are the most usual ground in order to abstract agony or pain, which is the fifth vital sign leading to long-term physically and psychologically detrimental effects.

Methods: A basic experimental (control group only for post-test) design using the technique of probability of simple random sampling in order to obtain sample size 105 was conducted in an Immunization Clinic at a selected PHC, Tamil Nadu, India. Ice cube was applied for about 30 seconds that is enfolded with gauze and then injected intramuscularly to administer the IM vaccine. In order to assess the pain level, an observation checklist based on Children's Hospital Eastern Ontario pain scale and Wong Baker's Faces pain scale was used.

Results: The study results manifest the higher statistical difference in the level of children's pain between the control groups and the experimental groups at a significance level of $p<0.001$. In order to reduce the pain level, the application of ice at LI-4 acupoint is effective.

Conclusion: The children who are being vaccinated pass through stressful events through the application of an intramuscular injection. The findings revealed that ice application at LI-4 acupoint was very effective in pain reduction, which is a simple, safe, non-invasive, very efficient, easy-to-administer intervention and cost-effective without side effects than any other pharmacological pain intervention.

Key words. Immunization, Intramuscular injection, Children, LI-4 acupoint, Ice application.

Introduction.

The rate of mortality and morbidity plays a vital source in infectious diseases worldwide. Data from 2018 shows the number of 679 million children with an approximate age limit of below five. Approximately 5.3 million children died, as shown in the data of 2018, and 0.7 million children died from "vaccine-preventable" infections. Countries with middle and low income had shown dead children's data, with 99% that resided in these countries [1,2]. Despite progression, diseases that are infectious continue to account for a notable proportion of childhood mortality and morbidity in India. About 1 million children in India die before reaching their fifth birthday. In order to protect the future and living of children, immunization plays an important way in cost-effectiveness and the most effective way. Immunization protects health, communities, and economies from vaccine-preventable diseases [3,4]. In May 1974, WHO officially launched an extended immunization program intended to safeguard every child in the globe from six vaccine-preventable illnesses, which are routinely practiced globally and in India [5]. Vaccination of either SC or IM inflicts pain in children at the injection site. Pain is related to the emotional, unpleasant sensory, along with the subjective experience of the damage of potential or actual tissues that are experienced during vaccination by the children [6]. According to the widely accepted definition of studying pain by "The International Association". "Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage" [7]. Stimuli of pain reaction are influenced by the variables of demographics such as gender, age, presence of a significant person, and child's weight, along with the perception of the individual's Pain. Pain is stimulated by any mechanical stimuli which activate nerve transmission with receptors [8]. These receptors stimulate A&C fibers which activate sympathetic nervous system and chemical mediated activators. These will carry the pain stimulus to the spinal cortex to perceive the pain. Any healthcare-related procedure is bound to reduce distress or pain and thus beneath the fundamental rights of humans. Control of pain is only achievable through measures, either non-pharmacological or pharmacological [9-10]. Techniques that are non-pharmacological, such as guided imagery, relaxation, distraction, pressure, massage, stimulation of cutaneous and transcutaneous nerve stimulation of electrical [11-12]. Non- pharmacological measures relieve the pain by stimulating the large nerve fibers, which results in "Closing the gate (Gate control theory)." Ice (or) cold application is a non-pharmacological measure that is a primary, cost-effective, simple intervention that acts to reduce the pain, and in some settings, it proves productive. Small-scale training along with a unit of reasons of theoretical sound is required for this approach [11-13].

Application of cold or ice on the injured part reduces the swelling, trauma, inflammation, and injuries on soft tissues and also stimulates constriction on blood vessels "(vasoconstriction)" and can enhance the cell's existence [12]. It decreases spasms and pain by blocking nerve conduction in nerve fibers. The input

of intense sensory reduces 50% of pain by producing a web between the forefinger and the thumb by the use of ice massage. Conduction of motor velocities and the decrease in the sensory is observed during the reduction of heat in the nerves; therefore, the pain intensity is averted. Thus, the efficacy of massage of ice for controlling pain system that is engaged with gate has been hypothesized by the researchers rather than removing pain source [14].

Over the past few decades, acupressure, an ancient Chinese therapeutic technique, has gained popularity worldwide due to its efficacy. Acupressure has been used for many years as a therapeutic technique, and it is currently the third most often used technique worldwide for treating pain and sickness. It is a simple, safe, effective, and economical form of therapy that uses the fingers to stimulate the key points [11-12]. According to Melzack, "Large Intestine Energy Meridian" "(LI-4)" a point cited as Hoku, is a focal area for pain sensation. Hence ice massage at this point will reduce pain. LI-4 is situated on the lateral midpoint of the inner of the first metacarpal among the forefinger and thumb within 3 – 4 mm of the location of an LI-4 [15-16] (Shiatsu Practitioner, 1998). Meridian pathway of energy refers as bilateral that starts from the exterior of the skin at the root of nail of index finger. It crosses the shoulder blade from the outward end and also courses on the arm's exterior portion [17-18]. In order to connect the transverse colon and the lower part of colon, the meridian leaves the surface of skin in the next. Under a point of chin, the meridian then returns to the surface of the skin later. The meridian from that point is again enfolded deeply within the area of double chin. It follows dental roots of the lower row, traversing the front of the mouth and emerging on the skin's surface, moving them to the teeth root's upper line, and facial tip close to the nostrils [15-16]. The flow of energy at the point of LI – 4, the meridian is nearest to the skin and can be comfortably stimulated with needles, pressure, or application of extreme hot and cold [15-18].

Studies proved that SP-6 and LI-4 acupressure points are effective in the reduction of myalgia and arthralgia pain [17]. Also, everyone has a source of natural power of healing. Acupressure includes the response of this healing stimulating selected points with needles, pressure, and triggers of posterior pituitary by utilizing cold and hot releases endodorphines, refer as the neurochemicals that ease pain [18- 20]. As a result, pain is reduced and the supply of oxygen and blood to the affected area increases. This relaxes the muscles and aids in the healing process [20-21]. Hence, the large meridian point has proven to be a method of safe, non-pharmacological, and effective method that relieves pain and can be administered in children when it is expected to be minimal or in short duration [22-24]. The investigators explored the most intense pain and problem after a considerable review of the treatment of infants that received immunization and children are afraid of pain during invasive procedures, which include injections [24]. They develop negative behaviour towards hospital visits due to the experience of pain [25]. Health care providers such as nurses can provide newborns getting vaccinations with an external ice application before the injection [26]. This technique will reflect a definite advancement in pediatric approach to pain management. Different literature supports the application of cold for the relief of pain, although this has not been accomplished in the community and clinical setting between the children who receive immunization.

Objectives.

1. To evaluate the pain level after application of ice at a specific LI-4 Acupoint in the experimental group and control group.
2. To assess the efficiency of the application of ice at a particular AcupointLI-4 on pain level amid the children receiving injection of Intramuscular for Immunization.
3. To find out the association on the pain level in children suing their variables of demographic in the experimental and control group.

Materials and Methods.

This study selected the quantitative approach. The basic experimental post-test only design was used in this research. It is a true experimental study, characterized by manipulation, control and randomization.

Children were picked arbitrarily, and the application of ice had done considering Children in group of experimental for 30 seconds. There is no pre-assessment done on level of pain for both the groups, Intervention using Ice application was done for experimental group prior to intramuscular injection along with level of post assessment pain evaluated utilising the Wong and Baker Faces Pain Scale and the observational checklist for one minute. For both the groups. The existing pattern of injection used for control group with the routine measures and the reactions observed. The immunization clinic was selected for the study to conduct at Government PHC, Tamil Nadu, India. The study was carried out in the immunization room of this Primary Health Center which had adequate number of subjects. On average 1000 children per month come for immunization and 20- 30 children per day. Children between the ages of 15 and 18 months comprised the study's population attended clinic for the immunization at selected PHC. On an average 60- 90 children per month were immunized at this age. The study samples were 105 children, who fulfilled the inclusive criteria. Criteria for sample selection included Children between the age group of 15–18 months attending the immunization clinic at selected hospital, Children belonging to both sexes, Children receiving first DPT booster dose, Care takers who offer willingness for their children to participate in the study. Children receiving any other injection apart from regular immunization, those who are blind, deaf and with development delays and those who are crying before starting procedure were excluded from the study.105 subjects included as sample size, out of which 53 received ice application before intramuscular injection and 52 received hospital routine measures. The simple random sampling technique was followed to allot the children to experimental and control group using lottery method. After a large-scale review along with the discussion with experts, the tool was progressed for the selection of common suitable assessment of pain along with the checklist from among the various types available. Considering the nature of the study the investigators has prepared observation chick list constructed on using **"Wong Baker's Faces Pain Scale" "Children's**

Hospital Eastern Ontario Pain Scale" for assessing the pain level in children.

3 sections are comprised in developing the tool. Section – A comprises the information regarding variable of demographic such as sex, age, religion, weight, place, Significant person with the child during the time of immunization and birth order. Section – B includes the Observation checklist which was developed based on the "Children's Hospital Eastern Ontario pain Scale," which comprises 4 items of behavioral reactions of a child, which include cry, Torso, Touch, and leg movements. The items were graded in terms of pain intensity viz No pain- Score 1, Mild pain- Score 2, Moderate pain- Score 3, along with Severe pain- Score 4. Section – C consists of Wong Baker's Faces pain scale which is a standard scale used for pain assessment and it comprises of 6 cartoon faces that ranges between very happy with smiling face for "no pain" and increasingly faces that are less happy to final sad, tearful face for "worst pain". The score interpretation done based on faces viz No pain in (Face – 0), a little hurt (Face – 1), a little more hurt (Face – 2), even more hurt (Face – 3), and an enormous amount of hurt (Face – 4) and Face – 5 with Worst pain.

Pilot study: The "pilot study" was managed in the clinic that specialized in immunization, Chennai. The investigation was carried out throughout a single week. The size of sample for pilot study in each group was 5. The analysis of the demographics of the "pilot study" showed a marginal difference in experiencing pain levels by both the groups at $p<0.05$ level.

Tool reliability: It was assessed using the inter–rater reliability method which was found to be highly reliable and there is no difference in the observation made by the investigator and the other nursing professional. The 'r' value was 0.98 and 0.96, respectively, for the "Observational checklist" and "Wong Bakers face pain scale," and hence tools were considered to be reliable for proceeding with the main study.

Data collection procedure: Later acquiring traditional agreement from the PHC Director, the data collection was preceded by the investigator. With a period of 4 months, the data was collected. The data were obtained during a four-month period. Self-introduction about the investigators and the nature of the information of the study was discussed with each of the selected children's caretakers. The investigators built a strong relationship with the children and caretakers while guaranteeing the privacy of the information. Written consent was obtained from the caretaker. The caretakers were made to sit on the stool with the child and the demographic data was collected by the investigators by interviewing them. Then, the participants were taken to the immunization room to give injections. Children were positioned by the caretaker and asked to make the children comfortable without crying during the intervention. A 2×3 cm ice cube was prepared in the refrigerator of the immunization clinic. Before being injected, the experimental group placed an ice cube covered in double-layered gauze to the LI-4 acupoint for 30 seconds. After the removal of the ice application 2-3 seconds later, the injection of IM was managed by the staff nurse. A separate ice pack was used for each subject. Injection of IM was given for the "control group" of children using quality technique without any prevention. Subsequently, the pain evaluation in both the "experimental group" and the "control group" was settled instantly by employing the two instruments for a minute. The behavioral changes were noted by the investigator, and the duration of the cry was noted with the help of a stopwatch. The same procedure and instructions were carried out on children in the "control group," but they never received the ice application.

Ethical consideration: Approval of formal administrative was acquired from the Hospital. Written consent was acquired from the caregiver prior to the initiation of data collection. The caretakers were assured that the information gathered would remain private.

Results.

From the Table -1 , it is inferred that in experimental group, majority 33(62.2%) children were between 15–16 months of age, 27(50.9%) were male children, 24(45.3%) were Hindus and 41(77.4%) children were from rural area, 32(60.4 %) children were weighing between 5 – 10 kg, 28(52.8%) children were between 86 – 100 cm in length, 38(71.7%) children were with the significant person during time of immunization and 33(62.3%) children comes under first birth order.

In the control group, 31(60.0%) children were between the age of 15–16 months, 27(51.9%) were males, 22(42.3%) children belonged to Hindu religion and 42(80.8%) were from rural area, 30(57.7%) children were weighing between 10 – 15 kg, 28(53.8%) children were between 86 – 100 cm in length, 40(76.9%) children were with the significant person during time

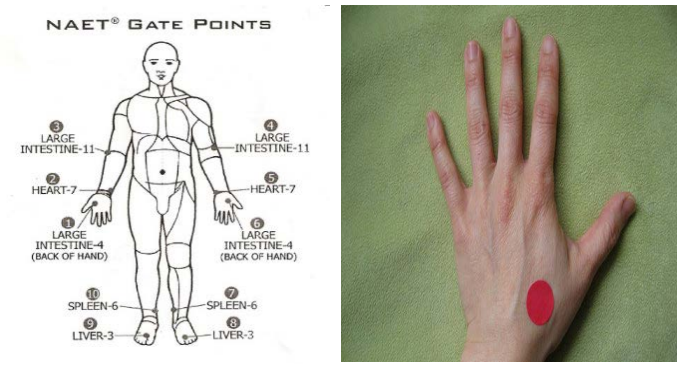

Figure 1. *Large intestine (LI-4) acupressure point.*
Source: *https://www.medicalnewstoday.com/articles/323402 https://acupoints.org/category/large-intestine-meridian-points/: https://www.myguru.in/Healing-What-are-the-Acupressure-Points-on-Human-body.html.*

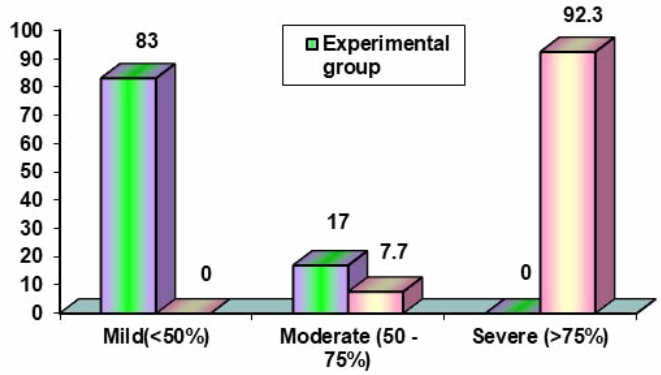

Figure 2. *Percentage and Frequency distribution of the pain level in children in experimental and "control group".*

Table 1. *Percentage and Frequency distribution regarding age, sex, religion, and children's place in the "control group" and "experimental group."*
N=105.

S.No	*Variables of Demographic*	Group			
		'Experimental group'		*'Control group"*	
		No.	%	No.	%
1.	Age a. 15 – 16 months b. 16 – 17 months c. 17 – 18 months	 33 10 10	 62.2% 18.9% 18.9%	 31 11 10	 60.0% 21.1% 18.9%
2.	Sex a. Male b. Female	 27 26	 50.9% 49.1%	 27 25	 51.9% 48.1%
3.	Religion a. Hindu b. Christian c. Muslim d. Others	 24 17 12 -	 45.3% 32.1% 22.6% -	 22 20 10 -	 42.3% 38.5% 19.2% -
4.	Place a. Rural b. Urban	 41 12	 77.4% 22.6%	 42 10	 80.8% 19.2%
5.	Weight a. 5 – 10 kg b. 10 – 15 kg	 32 21	 60.4% 39.6%	 30 22	 57.7% 42.3%
6.	Length a. 71 – 85 cm b. 86 – 100 cm	 25 28	 47.2% 52.8%	 24 28	 46.2% 53.8%
7.	Significant Person with child during time of immunization a. Mother b. Father c. Grand parent d. Others	 38 7 8 -	 71.7% 13.2% 15.1% -	 40 5 7 -	 76.9% 9.6 % 13.5% -
8.	Birth order a. First b. Second	 33 20	 62.3% 37.7%	 35 17	 66.0% 34.0%

Table 2. *Standard deviation and Mean of assessment of pain level of the 'control group' and "experimental group".*
N=105.

S. No	Level of Pain	Mean	Standard deviation
1	Experimental group	8.43	1.30
2	Control group	16.97	1.22

Table 3. *Comparison of pain level between "control group" and "experimental group".*
N = 105.

S. No	Level of Pain	Mean	Standard deviation	Unpaired "t" value
1	Experimental group	8.43	1.30	26.19***
2	Control group	16.97	1.22	

**p<0.05, **p<0.01, *** p<0.001*

of immunization and 35(66%) children comes under first birth order.

With regard to the pain level experienced by the children after ice application in the experimental group from Figure -2, 9(17%) had moderate pain, and 44(83%) had mild pain. In the control group, 48(92.3%) children had severe pain, and 4(7.7%) children had moderate pain.

From Table-2, the mean score for pain level in the children from the experimental group was 8.43 with a standard deviation of 1.30 as against a standard deviation of 1.22 and the mean score of 16.97 in the children from the control group.

With regard to the Table-3, standard deviation (1.30) and the mean (8.43) of "experimental group" that is measured with mean value of "(16.97)" along with value of standard deviation with " (1.22)" of control group that revealed calculated value of't' measure "26.19" which is greater than the table value. Thus, there was a higher difference in statistical pain levels among children in the group of experimental along with the control group at a "p<0.00" significance level.

With regard to the alliance of pain level with selected variables of the demographic in the Experimental Group, there was a moderate statistical significance alliance with the length of children at "P<0.01" level, a low statistically remarkable association of pain level with variables of demographic such as weight, age, and birth order at P<0.05 level. Variables of demographics such as weight, age, and birth were not associated significantly and significant person with the child during the time of immunization.

Concerning the selected demographic of the variables that are associated with the pain level of the control group. It is evident from the above table that there was no statistically significant association of level of pain with demographic variables.

Discussion.

The primary objective of the research was to evaluate the degree of pain experienced by both the experimental and control groups of children following the application of ice to the LI-4 acupoint.

The majority of the experimental group's children with "(83.0%)" experienced light pain while (92.3%) had severe pain in the control group. The nursing professional, as the provider of health, should board for the child's safety, age, comfort, and activity level and encourage caretakers to comfort and position the children. The pain level was assessed in children following the '**Observational checklist" and "Wong Baker's Face scale" in both the experimental and control groups** of children.

The value of standard deviation along with the mean pain score in the group of experimental l is 8.43 with a standard deviation of SD=1.30, and that of the control group, the mean score is 16.97 with a standard deviation of SD=1.22. The findings reveal that the experimental group experienced lower levels of pain than the control group. Perception of pain is common in children receiving intramuscular injections, which is unavoidable. Immunization prevents the transmission of infections, which reduces morbidity and mortality. When administered as injections, this vaccination hurts, but youngsters can be distracted in a number of ways to prevent the painful stimuli from spreading. Children in the experimental group had an ice treatment before receiving an injection at the LI-4 acupoint, and the results showed that the children in the experimental group had less pain than the children in the control group.

The findings obtained from the statistical analysis were in line with the findings obtained from a **quasi-experimental** study, which evaluated the impact of applying an ice pack to the site before venipuncture on the level of pain in 100 individuals chosen using purposive sampling. Ice pack applied around the site of venipuncture prior to venipuncture for 3 minutes. The intensity of pain in both groups was assessed using the Wong-Baker Faces Pain Rating Scale. In both groups, the pain score was compared. Results indicated that the experiment group reported a statistically significant decrease in pain during venipuncture [27].

To evaluate the efficacy of the application of ice in the second objective of the study, LI-4 Acupoint, by comprising the pain level among the group of experimental and group of control for children after administration of Intramuscular injection. The usefulness of the application of ice on the pain level among the children as the experimental group was being injected intramuscularly was evaluated utilizing the 't' test that is independent. The score of mean (8.43) along with the value of standard deviation (1.30) in the group of experimental as compared with the value of standard deviation (1.22) and the score of mean (16.97) revealed the computed value for the control group of 't' was 26.19. There was a high statistically remarkable variability at level of "P< 0.001" between the experimental group and the control group.

The findings of the study were in line with a "quasi-experimental" (post-test only control) design conducted using purposive sampling of non-probability with size of sample refers to 160 at Immunization Center in Rajbiraj situated in Nepal. Gauze over the Ice cube has wrapped and was applied on the site of injection for about 30 seconds before the management of injection followed by vaccine management. In order to assess the rate of pain the **"FLACC scale"** was utilized. The findings of the study show the application of cold that is effective on decreasing the pain. In order to reduce the pain as an effective technique the application of local cold can be utilized among the infants that received immunization. The interventions related to the effectiveness of the independent nursing enhance the level of safety and comfort among the children with zero risk factors [28].

The results of the study were in coincidence with the research that had assessed earlier to enhance the effectiveness and reduces the pain using pre4ssure during the injections of intramuscular on 93 infants who received immune globulin intramuscular injections in the lateralis vastus at a local health department. Pressure treatment of 49 had received by forty-eight at a site of acupressure where pressure was applied to the site for about 10 seconds suggested the approach by observation of anecdotal along with the theory of gate control. Standard injection received by 45 that applied zero pressure. The experimental group's mean pain intensity, measured on a 100mm "visual analog scale" and adjusted for injection volume variation, was 13.6mm, and a value of 21.5mm for the group of control. Simple manual pressure is suggested in the findings that had been applied as a fruitful technique to reduce the pain of injection. (p=0.03) [29].

Regarding the relationship between pain level and demographic variables, tables 2 and 3 show that, in the experimental group, there was no association found between pain level and demographic variables such as age, weight, and birth order, but there was a moderate statistically significant association with the length of children at P<0.01 level.

Conclusion.

In order to receive immunization for children the injection of intramuscular provides an event of stress. In order to reduce the discomfort and pain among the children it is essential to provide intervention of non-pharmacological or pharmacological. Such findings revealed that ice application at LI-4 acupoint was very effective in pain reduction [30]. Thus, it can be used as an alternative therapy by pediatric nurses to the children receiving intramuscular injections. Thus, applying ice at the LI-4 point is a simple, safe, non-invasive, highly effective, economical, and simple method of preventing pain from the pharmacological side effects rather than those caused by the drug. To reduce the severity and unpleasantness of pain resulting from intramuscular injection, it must be used in a clinical environment as a pain intervention strategy [31-32].

Study strengths and limitations: Ice application in children is a non-invasive, simple, and cost-effective technique used as a non-pharmacological pain control measure in children who receive immunization. Pain is inevitable, and all Children perceive pain when they receive injections. Hence, this ice application at LI-4 acupoint, which could be done in all settings,

helps to reduce pain perception, which enhances the physical and mental comfort of children in spite of exposure to painful stimuli. As there were limited studies done on application of acupressure in children, difficulties had faced by the investigator in course of obtain study literature that is related. As the size of sample was just 60 the findings could not be extrapolated. Also, pain is a subjective phenomenon that can result in bias of the findings obtained.

Implication.

The study findings have shown the implication in various branches of profession in nursing such as nursing education, nursing practice, nursing administration and nursing research. The usefulness of the assessment of application of ice through injection of intramuscular, there found a logical picture concerning utilizing simple, cost-effective alternate therapy in each settings for enhancement of the standards regarding profession of nursing which is used even as an independent nursing intervention for children. This reduces pain perception with a very minimal risk or no risk.

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