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EFFECTIVENESS OF NUTMEG SEED–ALOE VERA OINTMENT COMPARED WITH ICE COMPRESSES FOR BRUISE HEALING: A QUASI-EXPERIMENTAL STUDY

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ABSTRACT

Bruises are a common injury among Tapak Suci athletes, typically caused by impact or trauma that leads to bleeding under the skin, pain, and swelling. Despite their potential benefits, non-pharmacological therapies have not been widely chosen. This study aims to determine the effectiveness of giving Nutmeg seed and Aloe vera compared to ice compresses for bruise injury. A quasi-experiment design was used on 46 Tapak Suci athletes who were divided into two groups and selected using an accidental sampling technique. The intervention group was given Nutmeg seed and Aloe vera ointment for 7 days, and the control group was given ice compress therapy for 7 days. The instrument used was an observation sheet, and analysed using the Wilcoxon and Mann-Whitney tests ($\alpha \leq 0.05$). The study showed that 65.2% of respondents experienced fast healing after giving Nutmeg seed and Aloe vera. Both the intervention and control groups showed significant differences between pre-test and post-test results (p=0.001; p=0.000). There was a notable contrast in bruise colouration changes between the two groups during the pre-test and post-test assessments (p=1.000; p=0.001). In conclusion, Nutmeg seed and Aloe vera demonstrated greater efficacy in promoting bruise healing compared to ice compress therapy.

Keywords

Aloe vera, Bruise, Ice Compress, Nutmeg

INTRODUCTION

Bruises are injuries caused by impact or trauma. It is characterised by bleeding under the skin, skin discolouration, swelling, and pain. These injuries can occur in various parts of the body and have physical and psychological impacts (Al Marwah et al., 2023). It is a common problem among athletes in Indonesia, including Pencak Silat athletes. Injuries experienced by martial artists due to excessive physical activity or improper movements can affect performance and safety. Data shows that bruising injuries continue to occur among athletes before, during, and after matches or practice (Putri

dkk, 2022).

Worldwide, bruises or abrasions (70.9%) and lacerations (23.2%) are the most common injuries among athletes, accounting for 80.2% of all injuries. The most common cause of injury was falling (40.9%), followed by a motorcycle traffic accident (40.6%). The injury occurred in the following places: on a highway (42.8%), at home (36.5%), in agricultural areas (6.9%), and at school (5.4%) (Utami dkk, 2019).

According to Sri et al., (2021)In Indonesia, the prevalence of injuries is expected to remain the same or increase slightly. Assuming that the injury rate in Indonesia from 2019 to 2021 is similar to the rate in 2018, the rate is estimated to increase by 2%, from approximately 7.5% to 9.2%. In Solo, the most common injuries were bruises (59 athletes, 84.28%) and blisters (53 athletes, 75.71%). Other injuries included sprains (27.5%), lacerations (23.2%), and dislocations (27.85%). The remaining injuries were to the lower limb (64.5%), upper limb (33.69%), and included fractures (5.8%), severed limbs, eye injuries, and concussions, with respective proportions of 0.3%, 0.6%, and 0.4% in Indonesia.

Management of bruising injuries does not only rely on pharmacological therapy, but also requires a holistic approach that includes lifestyle changes and non-pharmacological interventions. Pharmacologically, bruises are treated with topical medications such as Betadine and Thromboflash Gel, which have the effect of preventing clots in the blood and help prevent blood clots (Damar et al., 2023). On the other hand, non-medical treatments such as the effectiveness of Saliara leaves (Lantana Camara L) can heal cuts and bruises for 10 days (Fitrian, 2018). The use of Moringa Oleifera seed extract can accelerate wound closure with a duration of 14 days (Saputra et al., 2020). Giving eel flour (Monopterus Albus) can accelerate the healing process of bruises for 14 days (Pauran et al., 2019). Honey application can heal scratches and bruises within 16 days (Uulolo dkk, 2016). Application of noni leaf extract ointment (Morinda Citrifolia L) can heal bruises for 7 days (Ariningtyas et al., 2024). Nutmeg seeds (Myristica fragans Houtt) can treat colds, analgesic and bruises for 7 days and have active compounds as antimicrobial, antibacterial, antioxidant, antifungal and anti-inflammatory (Feninlambir et al., 2023). Aloe vera is proven to heal wounds for 7 days because it contains antibiotic and anti-inflammatory compounds (Marhaeni, 2020).

Suloi (2021) mentions that Nutmeg seeds contain secondary metabolites, including alkaloids, flavonoids, saponins, tannins, phenols, and terpenoids, which may affect wound healing. Nutmeg plants contain flavonoid compounds that inhibit bacterial growth in healing wounds. Nutmeg seeds are used as an alternative to traditional medicines for wound healing that contain antimicrobial, antioxidant, antifungal, and anti-inflammatory compounds (Agaus dkk, 2019)

The results of the study indicate that Aloe vera is an effective natural ingredient for treating bruises. It contains various active compounds, such as polysaccharides, vitamins, amino acids, and phenolic compounds, which can be used to treat acute and chronic wounds (Rizqi et al., 2020). Aloe vera has been shown to significantly reduce inflammation, which accelerates wound healing (Happy et al., 2019). Aloe vera skin extract gel helps dry burn wounds and provides an anti-inflammatory effect (Yusuf et al., 2020).

In general, ice compresses reduce the production of prostaglandins, chemicals that cause inflammation and pain. This reduces symptoms of pain in bruising injuries (Fadila et al., 2021). Ice compresses are also effective in reducing tenderness and improving mobility (Rafyansyah et al., 2024). They can also significantly reduce pain and the incidence of hematoma (bruising) (Wulandari et al., 2021).

Nutmeg and Aloe vera seeds have been known to have potential in healing bruises. The combination of these two natural ingredients has the potential to provide a synergistic effect in healing bruises through reducing inflammation (polysaccharides, vitamins, amino acids, phenolic, bacterial growth inhibitory effects

(flavonoids) (Admaja et al., 2017). However, until now, there has been no research combining Nutmeg Seeds and Aloe vera, so researchers are interested in combining Nutmeg seeds and Aloe vera and observing their effectiveness in healing bruises. This study aims to determine the effectiveness of Nutmeg and Aloe vera seeds on the healing of bruises in Tapak Suci athletes.

METHOD

This study is a quantitative research quasi-experiment pretest-posttest with a control group design. The intervention group was given Nutmeg seeds and Aloe vera, while the control group was given an ice compress for comparison. The study took place from April 1 to 25, 2025, in Patihan, Babat Village, Lamongan Regency. The dependent variable of the study was Nutmeg and Aloe vera seeds with ice compresses; the independent variable was bruise injury.

The population consisted of 54 students who were part of the Tapak Suci athlete organisation. Using the accidental sampling technique, this group was narrowed down to 46 students, who were then divided into two groups: an intervention group of 23 students and a control group of 23 students. Respondents were selected based on inclusion and exclusion criteria. Inclusion criteria for the research were athletes who experienced bruising on the first day and were willing not to take medication during the one-week intervention. The exclusion criteria were athletes who experienced bruising but were unwilling to participate or whose bruising lasted more than one day. Dropout criteria included respondents who did not fully participate in the research process or resigned before it was complete.

The instruments used in this study include Nutmeg and Aloe vera seed ointment, ice compresses, and measuring instruments. To make the ointment, 150 grams of dried Nutmeg seeds and 150 grams of Aloe vera were used, along with enough water. The manufacturing process began by peeling the nutmeg seeds and separating the seeds from the skin. Then, the seeds were mashed until soft. Next, the aloe vera, which was washed and peeled, was mashed with the nutmeg seeds until smooth. Enough water was added, and then the mixture was put in a tightly closed container and stored in the refrigerator. To use the Nutmeg and Aloe vera ointment, take enough ointment and apply it to the bruised area twice a day.

To prepare ice compresses, place a handful of ice cubes in a small basin and position it on a 30×40 cm mat as a base. Apply the ice compresses directly to the bruised area for 20 minutes to help reduce bleeding and swelling. If the bruise is located on an arm or leg, elevate the affected limb above heart level to decrease blood flow. This procedure should be performed twice daily for optimal results.

In this study, the measuring instrument used was an observation sheet. The observation sheet was used to record colour changes in the bruises of the intervention group, which received nutmeg and aloe vera seeds, and the control group, which received ice compresses, from day 1 to approximately 7 days after treatment.

Researchers collected data by visiting the training site once every week on Thursdays to collect information on student bruising injuries. Furthermore, researchers visited the training ground twice a day, every day, to conduct research at the school. Students were required to live in the dormitory, and researchers visited the dormitory. Almost every day, 5-6 students experienced bruises. Researchers selected these students to explain the purpose and objectives of the study, the conditions of being a respondent, and to ask for consent to participate. If the respondent agreed, they were asked to sign an informed consent sheet. After the respondents signed the consent form, the researchers checked their skin colour and could begin the study. On day one, athletes were given nutmeg and aloe vera extracts provided by the researcher. The application could be performed twice a day for up to seven days.

Then, apply an ice compress twice a day for a maximum of seven days: morning at 7:00 a.m. and afternoon at 3:00 p.m. If the bruise was completely healed before the seventh day, stop the intervention on the day the injury was declared completely healed. The results of the pre- and post-injury examinations were tabulated and analysed.

Data processing was carried out with SPSS version 25. The data scale was ordinal, so no need for a data normality test. To test the effectiveness of ointment and ice compresses on bruises before and after treatment in both groups, the Wilcoxon test was used. To compare bruise healing between groups using the Mann-Whitney Test, with an error rate ($\alpha \leq 0.05$).

The Research Ethics Committee of Universitas Muhammadiyah Lamongan has declared this research to be ethically sound, issuing number 120/EC/KEPK-S1/03/2025 on March 21, 2025. Ethical clearance ensures that the research was conducted in accordance with ethical principles, including providing clear information, obtaining informed consent, guaranteeing data confidentiality, and protecting research participants, all in accordance with applicable regulations.

RESULTS

Out of a total of 54 Tapak Suci athletes, 46 individuals experienced bruise injuries, with an average of 5–6 cases per training session. Consequently, the final number of study participants who completed the research procedures amounted to 46 individuals. No participants declined to participate in the study, and none withdrew from the research.

Table 1 Demographic Data of Tapak Suci Athletes, Patihan Babat, April 2025 (n=46)

Variable		Intervention Group		Control Group	
		n	%	n	%
Gender	Female	6	26.1	16	69.6
	Male	17	73.9	7	30.4
Age (Years)	13	3	13.0	2	8.7
	14	3	13.0	6	26.1
	15	2	8.7	4	17.4
	16	6	26.1	5	21.7
	17	9	39.1	6	26.1
Education	Junior High School	12	52.2	12	52.2
	Senior High School	11	47.8	11	47.8

According to Table 1, 73.9% of the respondents in the intervention group were male, while 69.6% in the control group were female. In the intervention group, 39.1% of respondents were 17 years old, while in the control group, 26.1% were 14 years old and 26.1% were 17 years old. Both groups had the same percentage of junior high school students, at 52.2% of the level of education

Table 2: The bruises scale between intervention and control groups, April 2025 (n=46)

Group	Bruises Scale	Pre test		Post test	
		n	(%)	n	(%)
Intervention	Fast (0)	0	0	15	65.2
	Medium (1)	0	0	8	34.8
	Slow (2)	23	100	0	0
Control	Fast (0)	0	0	10	43.5
	Medium (1)	0	0	13	56.5
	Slow (2)	23	100	0	0
	Total	**23**	**100**	**23**	**100**

According to Table 2, Nutmeg and Aloe vera seed administration can reduce bruising severity in the fast (65.2%) and moderate (34.8%) categories. These percentages are higher than those of respondents who were given ice compresses, which showed decreases in bruising severity

of 43.5% in the fast category and 56.5% in the moderate category.**Table 3 Duration of healing process of Nutmeg seeds and Aloe vera on bruises injuries in Tapak Suci athletes compared to ice compresses, April 2025 (n=46)**

Group	N	Min-Max	*p*
Intervention	23	3-6*	0.001
Control	23	4-7*	0.000
Pretest Intervention dan control (Mann-Whitney, p=1.000)			
Posttest Intervention dan control (Mann-Whitney, p=0.001)			

*duration of the healing process in days

Based on the data in Table 3, the Wilcoxon test results show that Nutmeg and Aloe vera seeds have an effect on bruise healing (p = 0.001), as do ice compresses (p = 0.000). Mann-Whitney test results showed no difference in bruise healing before the test between the intervention and control groups at baseline (p = 1.000), but there was a significant difference in bruise healing after intervention between the two groups (p = 0.001). Therefore, Nutmeg and Aloe vera seed ointment healed bruises faster than ice compresses. Nutmeg and Aloe vera seed ointment reduced bruising injuries in 3-6 days, while ice compresses reduce bruising injuries in 4-7 days.

DISCUSSION

The results showed that applying Nutmeg and Aloe vera seeds can accelerate bruise healing almost as much as applying ice compresses. This aligns with research indicating that nutmeg seed cream accelerates wound healing more effectively than basic creams, such as ointments. According to anti-inflammatory research (Feninlambir et al., 2023) Nutmeg seed cream is more effective than basic creams. The ethanolic extract of nutmeg seeds has significant potential to accelerate the healing process of bruises. Nutmeg seeds can accelerate bruise healing in as little as three days (Suloi et al., 2021), for four days (Siregar et al., 2021), for five days (Agus et al., 2019).

The results of Marhaeni, (2020) show that Aloe vera skin extract gel can also help dry wounds, so that it provides an anti-inflammatory effect that helps reduce swelling. Study by Rizqi et al., (2020) showed how Aloe vera can significantly accelerate the wound healing process. Aloe vera can heal bruises within five days (Happy et al., 2019), (Fitriani et al., 2021) and (Yusuf et al., 2020). Aloe vera can also act as an anti-inflammatory in 48 hours, with a healing time of five days (Marhaeni, 2020) to six days (Admaja et al., 2017).

The combined effect of Nutmeg seeds and Aloe vera is proven to accelerate the healing of bruises up to 4 days faster than the natural healing process. Based on research, Nutmeg seeds can heal bruises in about 4 days (Siregar et al., 2021), while Aloe vera takes about 5 days (Happy et al., 2019). Both contain active compounds such as alkaloids, flavonoids, saponins, tannins, phenols, and terpenoids that are anti-inflammatory to reduce inflammation, as well as analgesics that provide a warm sensation to relieve pain and accelerate healing of bruises.

In addition, some researchers have used non-pharmacological therapies to treat bruises. For example, Saliara leaves (Lantana camara L.) could heal cuts and bruises in 10 days (Fitrian, 2018). Moringa oleifera seed extract can accelerate wound closure in 14 days (Saputra et al., 2020). Eel flour (Monopterus albus) can also accelerate the healing process of bruises within 14 days (Pauran et al., 2019). Applying honey can heal scratches and bruises in 16 days (Uulolo et al., 2016). The application of noni leaf extract ointment (Morinda citrifolia L.) can heal bruises in seven days (Ariningtyas et al., 2024). Nutmeg seeds (Myristica fragrans) can treat colds and bruises and act as an analgesic for seven days. They contain active compounds with antimicrobial, antibacterial, antioxidant, antifungal, and anti-inflammatory properties (Feninlambir et al., 2023). Aloe vera has been shown to heal wounds in seven days due to its antibiotic and anti-inflammatory properties (Marhaeni, 2020). Nutmeg seeds contain

secondary metabolites, including alkaloids, flavonoids, saponins, tannins, phenols, and terpenoids, which can inhibit bacterial growth in healing wounds. Aloe vera contains various active compounds, such as polysaccharides, vitamins, amino acids, and phenolic compounds, that have beneficial effects on wounds. These compounds significantly reduce inflammation, which accelerates wound healing (Happy et al., 2019).

When comparing the intervention group and the control group, applying ice compresses was also effective in accelerating the healing process of bruises, albeit at a slightly slower rate than nutmeg and aloe vera. Ice compresses are an effective and safe intervention for initial soft tissue injury management. They reduce prostaglandin production, which causes inflammation and pain. Thus, they alleviate pain symptoms in bruising injuries (Wulandari et al., 2021). Ice compresses can reduce pain and improve mobility when applied (Utami dkk, 2019). They can also significantly reduce pain and bruising (Wang et al., 2020). Studies have shown that cold compresses decrease pain intensity and reduce ecchymosis (bruising) (Putri dkk, 2022). Ice compresses are an effective therapy for reducing internal bleeding and swelling from bruising (Sri et al., 2021). Other studies have shown that cold compress therapy can prevent hematoma formation and reduce pain (Rafyansyah et al., 2024). Ice compresses work by lowering the temperature of injured tissue, which slows cellular metabolism, reduces oxygen demand, and limits blood flow to the injured area. This reduces the accumulation of blood and fluid that causes swelling and reduces pain by slowing the transmission of nerve impulses from the painful area (Ovi et al., 2021).

Based on the results of the study, significant bruise healing occurred on day 4 of the intervention for the intervention group and on day 5 for the control group. By the end of the study, all students were pain-free, and their bruises had faded. The decrease in bruising among Tapak Suci athletes occurred because they applied a mixture of nutmeg, aloe vera seeds, and ice compresses to the affected areas twice daily for one week (Okta et al., 2020). Nutmeg and aloe vera seed ointments can accelerate bruise healing due to their alkaloid, flavonoid, saponin, tannin, phenol, and terpenoid content, which act as anti-inflammatories that reduce inflammation in injured tissues and analgesics that provide a warming effect to reduce pain (Agaus et al., 2019). Ice compresses can help bruises heal by narrowing blood vessels, which reduces swelling and relieves pain. The cold temperature of ice slows blood flow to the bruised area, reducing the amount of blood that escapes from small blood vessels into the surrounding tissue (Wulandari et al., 2021). Applying ice compresses can reduce pain and swelling by constricting blood vessels and reducing blood flow to the injured area. This can also speed up the healing process and reduce pain from bruising injuries (Rumopa et al., 2018).

Non-pharmacological interventions have the advantage of a low risk of side effects (Norouzzadeh et al., 2025). However, their effectiveness tends to be slower, varies between individuals, and has no standardised dosage, as well as the potential to interact with other drugs (Dehkhoda dkk, 2024). Nutmeg seeds and Aloe vera can be used as an alternative or medical companion therapy in healing bruises and are proven safe for respondents because they do not cause allergies to the skin. However, further research is needed to find out if there are side effects if this ointment is used in the long term.

This study has several limitations; the first is a small sample size, which makes it difficult to generalise to a wider population. Second, the sampling was non-random and only included athletes who attended training, thus failing to cover the population with injuries outside of training activities. Third, the measurement of bruise healing used observation sheets, which are subjective in nature, thus allowing for observer bias.

CONCLUSIONS

Nutmeg and Aloe vera seed ointment has been proven to be more effective than ice compresses at healing bruises on Tapak Suci

athletes, with a faster healing duration of one day. This is because nutmeg and aloe vera seeds contain flavonoids that accelerate the repair of damaged tissues due to bruising. They also contain antioxidants that protect body cells from damage, anti-inflammatory properties that help reduce inflammation in the skin and body tissues, and antimicrobial properties that inhibit the growth of bacteria and fungi, helping to prevent infection. Ointments have also been proven to be a safe topical herbal therapy with minimal complications. Future researchers are expected to examine the use of seed ointments and aloe vera on children, infants, and the elderly to determine their wider potential use.

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