Surfing Proficiency Levels and Frequency of Upper Extremity Injuries

Saint Relly Bartfermil A. Landingin[1], Katrina A. Gaerlan[2], Vienna Grace Donnor[3], Frances Ruth Gaoiran[4]

[1]College of Physical Therapy, Lorma Colleges, saintrellybartfermil.landingin@lorma.edu, [2]College of Physical Therapy, Lorma Colleges, gaerlankatrina@gmail.com, [3]College of Physical Therapy, Lorma Colleges, viennagrace.donor@lorma.edu, [4]College of Physical Therapy, Lorma Colleges, francesruth.gaoiran@lorma.edu

Abstract

The rapid global growth of surfing has been accompanied with multiple factors associated with risk of injury, yet local studies remain limited in examining occurrence and impact of upper extremity injuries among surfers. This quantitative descriptive-correlational study examined whether surfing proficiency is associated with upper extremity injury frequency among surfers in San Juan, La Union, using a structured survey questionnaire and Spearman's rank-order correlation for analysis. The results showed that respondents were generally competent surfers, with an overall proficiency grand mean of 3.06, while upper extremity injuries occurred rarely in terms of both type and severity, with grand means of 2.00 and 1.94 respectively; rotator cuff strain was the most commonly reported injury. Statistical testing found no significant relationship between surfing proficiency and either the type or impact of upper extremity injuries, so the null hypothesis was accepted. In conclusion, the study suggests that skill level alone does not explain injury occurrence, and that other factors such as surfing conditions, training frequency, physical conditioning, and equipment use may play a larger role.

Keywords**:** *Injury Frequency; San Juan La Union, Surfing Proficiency; Upper Extremity Injuries; Skill Level; Impact;*

1. Introduction

As surfing becomes more popular, as a recreational and professional sport it has been linked with the rise of surf related injuries, highlighting the need to understand how skill level contributes to upper extremity injury. In retrospect, surfing is a dynamic water sport that involves riding waves using surfboards toward the shore. As a brief history of surfing, the sport traced origins to ancient Hawaiian culture as part of their culture then later on evolved into recreational pastime to coastal regions such as California and Australia, and later on recognized as professional sport worldwide (Biscontini, 2022). To date, surfing is one of the mainstream water-based sports with a population nearing 37 million surfers worldwide. Grounded on Olympic's surfing judging criteria as established by the International Surfing Association (ISA), surfing proficiency represents different skill-based levels, often categorized into beginner, intermediate, and advanced levels. Adopting this categorization provides a structured framework in examining injury frequency, particularly in the upper extremities.

The surfers who fall into the category of beginner level have been described as the newly introduced into surfing and are said to be in the process of developing their foundational surfing skills. This group mainly concentrates on developing their basics regarding the techniques of paddling, pop-ups, balancing, and awareness of ocean safety. Surfing for beginners is typically performed on smaller waves with height reaching approximately 1 to 1.5 feet, thereby minimizing exposure to stronger currents and complex wave dynamics. The basic phase of a Surfer is generally done by beginners with the use of foam surfboards because it has greater stability and helps reduce the risk of injury stated by (Siregar et al., 2022). Shorter surfing sessions require a higher relative physical effort due to inadequate paddling mechanics and limited wave reading ability, born from limited experience and technique. This level of injuries is mostly acute, mild in nature, often caused by falls, loss of balance or improper execution of basic movements as defined by (Liebert, 2025).

As surfers learn the basics and progress to the intermediate level they gain improved stability, paddling efficiency and water confidence. Intermediate surfers are able to paddle out past the breaking waves and reliably catch unbroken "green" waves. At this level they can perform basic turning manoeuvres and demonstrate improved wave-reading and positioning skills (Forsyth et al., 2024). At the advanced level, surfers are able to handle a wide range of surf conditions. These surfers are very capable of performing complex and risky manoeuvres such as tube riding and aerial surfing that requires them to read the wave, position themselves correctly and have refined coordination skills. Experienced surfers will usually surf the big waves that are from about 3 to 6 feet or so. In addition, competitive surfing, which is usually done by advanced surfers, requires high frequency training and conditioning (Magalhaes, 2022).

Since advanced surfing involves considerable paddling and many explosive movements, there will be a lot of mechanical stress on the body and upper extremities. While their technical efficiency is greater, the cumulative training load, combined with high-performance maneuvers and exposure to challenging environmental conditions, contributes to a higher prevalence of chronic and severe injuries. Advanced surfers may suffer more serious and chronic injuries than beginners due to a higher training volume (Santisteban et al., 2024). In general, the proficiency-based classification points to the trend of improvement in performance and the probability of sustaining injuries. The factors contributing to the occurrence of injuries to the upper extremities can be

considered as the increase of physical effort, volume of training, as well as other variables related to the increase of one's level of proficiency. This framework may be of help in studying the correlation of surfing proficiency level and incidence and impact of injuries among surfers in San Juan, La Union, as a basis for targeted injury prevention and rehabilitation strategies and skill-appropriate training interventions.

Those who are in sports and often train intensely are more likely to be injured (Liebert, 2025). Sports injuries are common problems of the musculoskeletal system which are faced by people at all levels from professionals to amateurs (Wang et al., 2024). Moreover, physical activity increases the risk of injuries to bone, muscles and soft tissues through over-use or over-training (Liebert, 2025). This can result from repeatedly performing the same activities as they exert high energy levels putting stress on specific areas of their body. In addition, accidents may also cause injuries primarily through sudden forces and environmental hazards which can result from falls, collisions, or sudden twists. Common injuries that are encountered in sports include sprains, strains, fractures, tendinitis, bursitis, dislocations, and Anterior Cruciate Ligament (ACL) injuries and other ligament tears (O'Reilly, 2024).

These injuries are increasingly evident in water-based sports such as surfing, in scenarios where the relationship between repetitive movements and uncertainties raises the danger. The location of these injuries are distributed across the body and are often due to impacts from surfboards. McArthur et al. (2020), have been attributed to mechanisms including being hit by a surfboard, wave maneuvers, and seafloor impact with incidence rates being between 0.3 and 13 injuries per 1,000 hours of surfing depending on different factors, such as surfer experience and environmental factors. Injuries to the Upper Extremity (UE) are all injuries that occur within the shoulder girdle region, arm, forearm to elbow joint. It refers to a range of conditions affecting the bones, muscles, tendons, ligaments, and joints. Many individuals experience UE injuries from various cases such as overuse, impact-related incidents, trauma, strain, repetitive use that can be manifested as pain, swelling, or limited movement (Minkoff., 2023).

UE injuries from surfing can occur as either traumatic, being a single, specific, and identifiable event, or gradual onset, being a micro-trauma without a single or identifiable event that caused the injury (Hanchard et al., 2021). In the study of McArthur et al. (2020), their findings reveals that the most common type of injuries that a surfer may experience are those related to the skin that involves abrasions, lacerations, burns, hematomas, and contusions, amounting to 46% of cases. This was followed by soft tissue injuries at 22.6%, that includes muscular strains, cramps, ligament sprains or ruptures, and tendon issues. Bone fractures showed up less often and comprised 9.6% of incidents. While the other 7.5% cases involved dislocations, subluxations, cartilage disruptions, meniscus tears, bursitis, and vertebral facet issue. In terms of severity, the authors further classified injury, from mild to severe cases, in its characteristics and clinical implications.

Mild injuries, often self-managed, predominantly involve superficial skin damage or minor contusions, which are frequently captured in the author's survey data. Moderate severity involves soft tissue sprains or strains that cause temporary disablement of surfing activities. The most visible records are of severe cases, such as fractures, major lacerations, or dislocations (Oliveira et al., 2024). Epidemiological data indicate that a high percentage of these injuries occur in the upper extremities, due in part to rapid growth of participation and performance demands. Obana et al., (2023)

also showed the shoulders (45.5%), fingers (12.7%) and hands (11.3%) as the most commonly injured upper extremity parts in surfing, with mechanisms such as board-to-body impact (22.4%), collisions with sand (12.6%), and water impact (7.9%) contributing significantly. Out of a total of 33,323 surfing-related injuries included, the shoulder was accounted for at 45.5% being the most commonly injured upper extremity region among surfers. This high incidence is attributed to the repetitive overhead movements performed in the prone paddling position, which place continuous strain on the rotator cuff and periscapular muscles. These repetitive actions contribute to overuse injuries, representing approximately 40% of all strain-related injuries in surfing.

In surfing, the most common upper extremity injury sites were the arm (35.7%), shoulder (20.3%) and hand (17.4%). The mechanisms of injury included contact with the board (22.4%), sand (12.6%) and water (7.9%). The most common site of injury in the upper extremity was the shoulder, which was responsible for 45.5% (33,323 injuries) of the 73,135 total surfing-related injuries. The incidence is high due to repetitive overhead motions in the prone paddling position which places constant stress on the rotator cuff and periscapular muscles. Repetitive motions can cause overuse injuries and are responsible for almost 40% of all surfing strain injuries.

High incidence due to repetitive overhead movements involved in the prone paddling position that causes constant strain on the rotator cuff and periscapular muscles. The repetition leads to overuse injuries, which account for around 40% of all strain-related surfing injuries. Surf paddling is a basic skill of surfing with high biomechanical demands on the upper body . The propulsive phase consists of the pectoralis major, latissimus dorsi, subscapularis, triceps brachii, and erector spinae muscles which produce shoulder flexion and extension to move the surfer forward. Overuse or inappropriate use of these muscles may lead to overuse injuries such as sub-acromial pain with repetitive shoulder elevation and internal rotation (Langenberg et al., 2021).

When surfers compete they have to paddle several times in one competition, which increases the demands of surfing biomechanics. The study by Hanchard et al., (2021) highlights four ways surfers spend their time at sea.They include paddling, positioning themselves in place, riding the waves, and engaging in auxiliary tasks like wading, recovery, and duck diving. All these processes need muscle power, endurance, stability, breathing control, and repetition.

Besides these aspects, it is important to take into consideration that surfing is practiced in a dynamic environment in which constant decision-making is required. These decisions affect both sports performance and the chances of getting injured. Performance improvement and possibly avoiding injuries depend on experience, knowledge of wave patterns, and the ability to read and adapt to changing wave conditions (Santisteban et al., 2024). In addition to environmental awareness, the physical demands imposed by surfing posture and movement mechanics also play a crucial role in both performance outcomes and injury risk. During the practice of surfing, the surfer spends most of the time (more than 60%) lying prone on the surfboard. This position, similar to the crawl swimming position, relies on using a rigid surface in the ventral region (the board), which requires an increased angle of extension of the cervical and lumbar spine and movements of the upper limbs also with specifics of the sport. During this time of practice there is a strong demand for the musculoskeletal system in the cervical and lumbar spine, as well as in the shoulder

region, which are important points of manifestation of complaints related to surfers' chronic injuries. (Lima et al.,2025)

Building on these biomechanical demands, further analysis of surfing posture helps explain how prolonged positioning contributes to musculoskeletal stress. Based on the study of Lima et al. (2025), surfers spend 60% of their time lying prone on the board. This posture resembles the crawl-stroke position, an alternating arm movement and a flutter kick while lying face down, in swimming. However, surfing significantly differs from swimming as it relies on a firm board that supports the front of the body, which increases the required extension angle of the cervical and lumbar spine and involves upper-limb movements unique to the sport. This sustained position places mechanical load on the cervical and lumbar regions of the body, as well as the shoulders which are often associated with chronic overuse injuries in surfers. Furthermore, surfers have also demonstrated increased postural control and shoulder internal rotation. This is significant considering that an efficient stroke requires a high degree of rotation around the shoulder for paddling (Donaldson et al., 2022).

Given these repetitive biomechanical stresses, epidemiological evidence further highlights the prevalence and distribution of surfing-related injuries. In the study of (Remnant et al., 2020), there were 1473 respondents with age ranges from 8-74 years that reported a total of 550 gradual-onset major injuries: 44% acute duration (<3 months) and 56% chronic (≥3 months). The injury incidence proportion was 27%. Shoulder (146 injuries, 64% chronic), low back (115 injuries, 58% chronic) and neck (105 injuries, 46% chronic) were the most commonly reported injury locations. Prolonged paddling was the most commonly reported mechanism of injury (40% of all injuries). Incidence proportion for gradual-onset major injuries was 6% higher for greater surfing abilities compared to lower abilities ($p=0.01$), and 13% higher for long boarders compared to short boarders ($p=0.001$); this indicates the representation of mechanisms of major chronic injuries. Prolonged paddling is the most frequent major chronic mechanism of injury.

Recent studies report that 19–27% of traumatic and gradual-onset surfing injuries involve the shoulder. Surfers spend approximately 45–60% of a session paddling, often covering distances up to 5 km, placing substantial repetitive load on the shoulder. Gradual-onset shoulder injuries are related to increased levels of surfing experience, advanced age, and frequent participation in this sport. Thus, the increased paddling volume seems to be the main factor causing shoulder injuries. The typical duration of shoulder injuries is over three months, and such injuries may demand surgical interventions. Shoulder injuries involve the diagnosis of shoulder instability (48%), rotator cuff tear (42%), and labral tear (35%). Coordinated scapulohumeral movement is required for efficient shoulder function. However, repetitive paddling combined with scapular dyskinesis may change normal scapular upward rotation–glenohumeral elevation ratios that may lead to increased joint stress and contribute to shoulder pain and injury (Re et al., 2023).

Moreover, previous studies about surfing injuries have also highlighted the frequency of injury in terms of performance level. As exemplified by Santisteban et al. (2024), their findings shows that surfers increase the risk of injury by pursuing maximum performance, and this is frequent to those professionals who are participating in competitions. This is aligned with Minasian & Hope (2021), where they argued that within other sports, those who engage in the sport through competition end up being

more prone to injury compared to their counterparts who are just involved in recreations or novices due to the increased volume of work done.

By 2024, there was much advancement on the surfing scene of the Philippines considering its diversity of surf breaks as well as international recognition. On the Northern Luzon, San Juan, La Union emerged as "The Surfing Capital of the North" through hosting various competitions and training programs which make possible the presence of resident surfers, instructors and competitors (Trinidad, 2025). San Juan, La Union is one of the biggest players in the local economy, with surfing tourism contributing around ₱2 billion in 2023–2024.

Although international research provides valuable information on injuries related to surfing, data on it in the local setting are limited. Further, the value of sports rehabilitation is increasingly recognized, a significant gap persists in the availability of comprehensive programs specifically designed to address the needs of injured surfers. Lack of Philippine-based research on how surfers specifically manage upper extremity injuries, despite these being a major cause of pain and downtime.

This study determined the correlation between surfing proficiency level and the frequency of upper extremity injuries among the surfers in San Juan,La Union. In addition to that, there were certain limitations faced by the research because its scope included only San Juan and not all the areas with surf sites in La Union.Since this research adopted a correlational approach, it was unable to establish a cause-and-effect relationship between the variables..

With the help of evidence-based findings, this research identified the relationship between the level of surfing skills and incidences of upper extremity injuries in San Juan, La Union. Through this study, it was possible to understand how upper extremity injury incidences were influenced by the level of surfing skills in San Juan, La Union. In this regard, this study benefited the following:

To the Surfers, this study helped them understand the different upper extremity injury risks related to their proficiency. With this study, they were able to apply appropriate training routines and injury prevention strategies corresponding to their proficiency.

To the Surfing Instructors and Schools, this study improved their teaching and safety procedures. With the knowledge that certain proficiency levels are more prone to particular kinds of injuries, they were able to modify their class lessons and properly train their students according to their respective proficiency levels.

To the Local Government Units (LGUs), the study allowed LGUs to aid in the creation of more efficient laws concerning the public’s health and safety. These include appropriate coastal beach zoning, compulsory orientation on surfing, and safety measures posted at coastal beaches. The results of this study aid in making better policies concerning sports tourism and management by ensuring that the activity is both safe and sustainable.

To Physical Therapists, the study was highly beneficial as it gave vital information regarding the link between various surfing skill levels and the incidence of upper extremity injuries. The knowledge allowed PTs to create injury prevention programs for beginner, intermediate, and professional surfers based on scientific data. It also helped the PTs to accurately assess by predicting how some injuries occurred and diagnosing and treating them accordingly. Furthermore, the findings endorsed the use of specific return-to-sport programs focusing on improving paddling endurance, shoulder

stability, and trunk control, which are essential skills for surfing performance. Physical therapists were able to utilize the results to educate the surfing community about safe training techniques, proper body mechanics, and measures to prevent recurring injuries.

To Healthcare Professionals, especially Physical Therapists and Sports Medicine Practitioners, the study was useful in terms of assessing the incidence of upper extremity injuries among surfers. Healthcare professionals will be able to come up with better rehabilitation plans as well as strategies that can prevent such injuries from happening to surfers.

For researchers, the study made contributions in terms of providing a solid base of information regarding surfing injuries in the Philippines, focusing mainly on those occurring in San Juan, La Union. There is not much literature regarding surfing-related injuries in the Philippine setting, so there is still much room for improvement when conducting research on the topic. In particular, the findings were useful as they addressed the gap regarding whether proficiency levels played an influence on the incidence of injuries. Furthermore, they could provide a solid foundation for future studies, particularly concerning biomechanics, injury prevention programs, rehabilitation programs, and comparisons between other surfing sites. Also, the results were useful in terms of policy-making.

To Future Researchers, the study made important contributions to the limited body of literature regarding injuries associated with surfing in the Philippines. It served as a baseline for future studies on different surfing communities in the country.

2. Statement of the Problem

This study aimed to determine the correlation between surfing proficiency levels and the frequency of upper extremity (UE) injuries.Specific objectives include:

1. What is the level of surfing proficiency among surfers?
2. What is the frequency of upper extremity injuries among surfers?
3. What is the impact of upper extremity injury on the level of surfing proficiency among surfers?
4. Is there a significant relationship between surfing proficiency level and the frequency of upper extremity injuries among surfers?
5. What physical therapy-based intervention protocols can be recommended to improve levels of surfing proficiency and prevent upper extremity injuries among surfers?

3. Materials and methods

The study utilized a quantitative descriptive-correlational design within a quantitative framework to address the research objectives and examine how prevalent are upper extremity injuries to surfers in San Juan, La Union in relation to their surfing proficiency. The descriptive design determined the distribution of surfers across proficiency levels as well as the frequency of upper extremity injuries in terms of type and impact. Whereas the correlational component examines the statistical relationship between surfing proficiency level is and the frequency of upper extremity injuries.

Respondents were recruited in a practical and efficient manner, as convenience sampling was utilised to obtain data from surfers readily available in San Juan, La Union. This means the researchers could choose to include participants based on who was available, instead of randomly. The researchers focused on the surfers available

during five to seven days of data collection. Recruitment was conducted on weekends in the Urbiztondo Beach, where surfing activity is at its peak that could introduce a population of surfers at key sites like beaches and surf schools. A total of 45 respondents were recruited, which exceeded the initial target sample size of 30 respondents.

The main tool for data gathering was a structured survey questionnaire composed of 42 close-ended items. It consists of three main sections: Section 1 assessed the level of surfing skill (beginner, intermediate, advanced) and was designed to measure self-reporting of skill, confidence and performance in core surfing tasks. Section 2 assessed the frequency and characteristics of upper extremity injuries focusing on injury type. Section 3 determined the impact of injuries to a surfer's performance and daily activity. To enable statistical correlations and group-level description, 4-point Likert scales were used across sections and coded numerically for analysis, allowing computation of weighted means and correlation coefficients.

Prior to the data collection, The researchers first prepared a complete research protocol, including the letter of intent, a study summary, and the questionnaires. Approval to the Dean of the College of Physical Therapy was sought first. After receiving the initial approval, the research protocol was forwarded to the Lorma Colleges - Research Ethics Committee (LC-REC) for ethical review. The study was carried out only after obtaining full approval of LC-REC and following the institutional policies and ethical guidelines.

In the pilot testing phase, the questionnaires were implemented to a sample of 10 surfers from Bacnotan, La Union that also have the same characteristics as the final respondents. The data obtained were analyzed using Cronbach's alpha (α) coefficient to assess internal consistency and reliability of the overall scale and each subscale of the questionnaire. This ensured that the final instrument was user-friendly and capable of capturing accurate and consistent data from surfers in San Juan, La Union.

Table 1. Pilot Study Cronbach's Alpha Reliability Results

Sections	Number of Items	Cronbach's Alpha (α)	Internal Consistency
Surfing Proficiency Levels	25	0.96	Excellent
Type of Injury	10	0.76	Acceptable
Impact	7	0.78	Acceptable
Overall	42	0.87	Good

Note. Interpretation: <0.5 = Unacceptable; 0.5–0.6 = Poor; 0.6–0.7 = Questionable; 0.7–0.8 = Acceptable; 0.8–0.9 = Good; >0.9 = Excellent.

Table 1 reveals how the internal consistency was found to be good for the overall scale (α = 0.87). Across subscales, the surfing proficiency levels section obtained excellent reliability (0.96), while the type of injury (α = 0.76) and impact (α = 0.78) were acceptable. These results indicate that the questionnaire was a reliable instrument for assessing surfing proficiency, injury types, and impacts in a surfing population. To add validity, expert evaluation was performed by three independent experts: sports science instructor, a professional surfing instructor, and a licensed physical therapist. An expert language critique was also integrated to eliminate semantic ambiguity.

Data curation and statistical computations were conducted using Microsoft Excel and verified by a licensed statistician. Continuous variables derived from the Likert scales were analyzed as weighted mean scores (*M*) and categorized using predefined interpretive matrices (Table 2). Descriptive statistics, frequency counts, percentages, and weighted means, were used to characterize the sample's distribution across proficiency levels, injury modalities, and impact severities. Because the ordinal data and composite weighted mean metrics did not satisfy the assumptions of normality required for parametric modeling, non-parametric inferential statistics were applied. The statistical relationship between the independent variable (surfing proficiency score) and the dependent variables (injury frequency and functional impact) was evaluated using Spearman's rank-order correlation coefficient (*rs*).

Table 2. Interpretation of Upper Extremity Injury Frequency and Impact on Surfing Proficiency Level by Weighted Mean

M	VI	Type of Injury	Impact of Injury
1.00–1 74	Never	No reported occurrence of specific UE injury types	No functional impact; injuries do not affect surfing performance or daily activities
1.75–2.49	Rarely	Injuries occur infrequently; minimal exposure to UE injury types	Minimal impact; slight discomfort but no major disruption in surfing or function
2.50–3.24	Sometimes	Moderate exposure to UE injury types	Moderate impact; injuries occasionally affect surfing performance or recovery
3.25–4.00	Frequently	Injuries occur regularly; high exposure and recurring UE injury patterns	Severe impact; injuries consistently limit surfing ability and daily functioning

Legend: Weighted Mean (M); Verbal Interpretation (VI)

4. Results

Level of Surfing Proficiency Among Surfers

Based on the five core judging criteria adapted from Olympic and International Surfing Association (ISA) standards, responses were rated using a four-point scale ranging from Novice to Excellent, reflecting the surfers' perceived consistency, control, and performance complexity in actual surfing conditions. The results are organized into beginner, intermediate, and advanced skill domains, providing a comprehensive overview of overall proficiency levels and progression across surfing competencies.

Table 3: Level of Surfing Proficiency Among Surfers

Indicators	*M*	VI
1. Fundamental Board Control: I have learned the basics of paddling and sitting on the surfboard.	3.42	E

2. Equipment Appropriateness: I typically use a longer or more stable board (e.g., longboard or foam board).	3.60	E
3. Maneuver Diversity: I can perform at least 3 distinct maneuvers on a single wave.	3.22	D
4. Stance Versatility: I surf effectively on both forehand and backhand with variety.	3.13	D
5. Paddle-Out Capability: I can effectively paddle out past the break without experiencing exhaustion.	3.31	E
6. Duck-Dive Efficiency: I can duck-dive or turtle roll effectively to manage oncoming small or big waves.	3.16	C
7. Wave Reading Ability: I can read wave conditions to choose suitable waves.	3.24	C
8. Seamless Linking: I connect major maneuvers instantly without "dead time."	2.93	C
9. Flow Between Sections: I transition from bottom to top, turning fluidly.	3.04	C
10. Exit & Entry: I exit one maneuver and immediately enter the next critical section.	2.91	C
11. Speed Generation: I generate my own speed using pumping and rail-to-rail transitions, and maintain continuous speed through turns without stalling.	2.98	C
12. Board Adaptability: I experiment with different board types depending on surf conditions.	3.00	C
13. Critical Section Usage: I consistently position myself and execute maneuvers in the "pocket" (steepest, most critical part) of the wave.	2.93	C
14. Risk Acceptance: I commit to high-risk maneuvers (e.g., late drops, vertical turns).	2.98	C
15. Wave Size Challenge: I confidently paddle into and ride the largest or most hollow waves available.	3.22	C
16. Break Type Versatility: I am comfortable surfing different types of breaks (beach, point, reef).	3.13	C
17. Maneuver Complexity: I attempt technically difficult maneuvers (e.g., aerials, tube rides).	2.80	C
18. Progressive Techniques: I incorporate modern techniques such as aerial rotations or reverse landings.	2.76	C
19. Unconventional Lines: I draw unique lines on the wave that differ from standard trajectories.	2.71	C
20. Creative Recovery: I recover from critical situations or near-falls with advanced board control.	3.22	C
21. Repertoire Expansion: I practice and introduce new, non-standard maneuvers.	2.96	C
22. Power Application: I displace significant water during turns, showing strong force.	2.98	C

23. Competitive Engagement: I participate in higher-level surfing competitions (locally and internationally).	2.47	C
Mean Score	**2.95**	**C**
Grand Mean	**3.06**	**C**

Note. Verbal Interpretation (VI): 1.00–1.74 = Novice (N); 1.75–2.49 = Developing (D); 2.50–3.24 = Competent (C); 3.25–4.00 = Excellent (E).

Table 3 results showed a generally competent level of performance across respondents with a grand mean score of 3.06.

It is worth noting that beginner levels had the highest overall mean (3.33), suggesting that foundational competencies were well demonstrated by this cohort. The highest scores were particularly in equipment appropriateness (3.60) and basic control of the board (3.42). This pattern suggests that respondents were able to interact effectively, namely, the equipment used, with more stable and functional movement patterns.

"Experimental evidence has shown that properly scaled equipment improves accuracy and functional coupling of limb segments, while improperly scaled equipment may restrict movement by 'freezing' degrees of freedom" (Buszard, 2020).

However, the beginner level showed relatively lower scores in manoeuvre diversity (3.22) and stance versatility (3.13), pointing to limitations in more complex and adaptive aspects of performance. These findings indicate that basic control was learned, but the variance of movements and adaptation to changing task demands were still in their infancy. Research in surfing and skateboarding (Van Der Sandt et al., 2026) demonstrates that complex manoeuvres and tactical variability are emergent, context-dependent skills that typically develop with more practice and exposure to representative learning environments. Thus, the observed cross-domain inconsistencies suggest a sequential pattern of development, in which basic skills are stabilised prior to the development of adaptive and flexible movement capabilities.

The results show that if the right equipment and conditions for learning are provided, beginners can acquire sound basic skills. But their capacity for adaptation and performance of different movements was limited, suggesting the need for more varied and challenging practice. It means that in training you want to establish firm fundamentals first, and then diversify to increase adaptability.

Results also show that intermediate surfers tend to perform at a relatively competent level (mean score of 3.04) indicating that within this stage a solid foundation of fundamental surfing skills has been established that can be maintained across different conditions.

Higher scores that stood out were Wave Reading Ability (M=3.24) and Duck‑Dive Efficiency (M=3.16). These two appear to form reinforcing performance patterns such as efficient duck‑diving and paddling conserve time and energy, enabling surfers to position themselves more effectively and thereby maximize the benefits of accurate wave reading.

Conversely, strong wave reading improves positioning, increasing access to quality ride opportunities and enhancing the effectiveness of duck‑diving. According to a study of Mejuto et al. (2024), recent GNSS and time–motion syntheses confirm that higher‑skill surfers achieve greater ride frequency and higher ride speeds while

incurring lower relative physiological load per ride, underscoring that wave selection and positioning are key determinants of performance efficiency.

However, comparatively lower scores were noted in Seamless Linking (M=2.93) and Exit and Entry (M=2.91), suggesting limitations in the integration and refinement of maneuvers. These aspects require continuous wave engagement and fluid transitions, which may not yet be fully developed at the intermediate level.

This pattern may be explained by constraints in actual ride opportunities. Mejuto et al also demonstrates the intermittent nature of surfing, with a large proportion of session time devoted to paddling and waiting and only brief windows of high-intensity riding. As a result, intermediate surfers often have limited exposure to extended ride sequences, restricting their ability to practice maneuver linking and to execute polished exits and entries consistently.

These findings as a whole suggest that intermediate surfers show competency in basic and preparatory skills, but refinement of complex, continuous and adaptive movement patterns are still in progress specifically in the Intermediate level.

The results further indicated a generally competent level of performance among respondents in the advanced level as indicated by a mean score of 2.95.

Higher scores were especially notable in Wave Size Challenge (M=3.22), Creative Recovery (M=3.22), and Ocean Dynamics Mastery (M=3.20). This hints that the respondents demonstrated an increased capacity to meet complex demands in the environment and modify the performance according to the circumstances dynamic in nature. This pattern indicates that expert surfers were able to integrate sensorimotor coordination and environmental awareness in a manner that led to more efficient and reactive movement execution in challenging wave contexts.

Frequency of Upper Extremity Injuries Among Surfers

This section presents the computed weighted means and the corresponding verbal interpretation for the frequency of ten specific upper extremity injuries among surfers. Higher mean scores reflect how common is the occurrence of injury, whereas lower mean scores indicate minimal frequency of the specified injury.

Table 4: Frequency of Upper Extremity Injuries Among Surfers in Terms of Type of Injury

Indicators	*M*	VI
1. Rotator Cuff Strain: Dull ache or sharp pain deep in the shoulder from repetitive paddling.	2.56	S
2. Fin Laceration: Cuts or slices to the hand/arm caused by surfboard fins during a wipeout or kick-out.	2.13	R
3. Leash Entanglement: Injury to fingers or hand caused by the leash wrapping around the limb under tension.	2.13	R
4. Hyperextension Sprain: Elbow or wrist bent backward forcefully during a "push-up" takeoff or fall.	1.84	R
5. Impact Contusion: Bruising or "dead arm" sensation from direct collision with the surfboard (rails/nose).	1.96	R

6.	Nerve Paresthesia: Numbness, tingling, or "pins and needles" radiating down the arm to the fingers.	1.69	N
7.	Reef/Sand Abrasion: Scrapes or "road rash" on arms/hands from contact with the sea floor.	2.31	R
8.	Epicondylitis Symptoms: Pain on the outside (Tennis Elbow) or inside (Golfer's Elbow) of the elbow from gripping rails or paddling.	1.73	N
9.	Bursitis/Inflammation: Swelling or heat in the shoulder or elbow joints after long sessions.	2.00	R
10.	Joint Dislocation/Subluxation: Sensation of shoulder or finger "popping out" and back in (instability).	1.62	N
	Grand Mean	**2.00**	**R**

Note. Verbal Interpretation (VI): 1.00–1.74 = Never (N); 1.75–2.49 = Rarely (R); 2.50–3.24 = Sometimes (S); 3.25–4.00 = Frequently (F).

Table 4 displays the frequency of upper extremity injuries among surfers in terms of different types of injury. The results show a grand mean of 2.00, indicating that upper extremity injuries among surfers are generally infrequent and low in frequency. This makes clear that injuries are present but are not common to most surfing activities.

The Highest mean score was found in Rotator Cuff Strain (M=2.56) with verbal interpretation of Sometimes. Repetitive paddling is the cause of the most common upper extremity injury suffered by surfers, shoulder pain, it says.

On the other hand, several injuries were reported as occurring only rarely. Reef/Sand Abrasion (M = 2.31) suggests that scrapes from contact with the seabed still occur but are not frequent. Fin Laceration (M = 2.13) and Leash Entanglement (M = 2.13) suggest that injuries from surfboard equipment and accidental entanglement occur at similar and relatively low rates. Contusion Impact (M = 1.96) and Bursitis/Inflammation (M = 2.00) are also classified as rare injuries, suggesting that direct impact injuries and joint inflammation are not common but may occur after long surfing sessions. The other infrequent injury type is hyperextension sprain (M = 1.84), indicating that forced bending of the wrist or elbow during falls or takeoffs is not common, but occurs in some situations.

The least frequent injuries are in the never to rarely experienced group, such as Nerve Paraesthesia (M = 1.69), Epicondylitis Symptoms (M = 1.73), and Joint Dislocation/Subluxation (M = 1.62). These findings suggest that surfers do not experience more severe or chronic upper extremity conditions, which would suggest that such injuries are only present in extreme conditions or after prolonged physical strain.

The findings generally illustrate that upper extremity injuries are generally rare among surfers and most occur at a rare level with mostly mild or short term conditions. The most obvious problem however is shoulder strain from repetitive paddling movements. This signifies that injury prevention should focus on strengthening the shoulders, improving paddling technique, and promoting proper body mechanics to reduce repetitive stress.

Impact of Upper Extremity Injury on the Surfing Proficiency Level

The findings in this section reveals how injury-related symptoms and limitations influence surfers' actual performance during and after surfing sessions. Each indicator was rated using a weighted mean and interpreted using a four-point scale to determine the extent to which Upper Extremity injuries impact overall activity and performance of surfers.

Table 5: Impact of Upper Extremity injury on the surfing proficiency level

Indicators	*M*	VI
1. Pain During Paddling: Pain present while paddling that does not stop the session but is noticeable.	2.31	R
2. Pain Post-Surf: Pain or stiffness that begins after the session (e.g., that night or next morning).	2.51	S
3. Session Shortening: Had to end a surf session early, specifically due to arm/shoulder pain or injury.	1.91	R
4. Technique Modification: Had to change how I paddle or pop-up (e.g., one-armed paddling) to avoid pain.	2.09	R
5. Self-Medication: Took painkillers (NSAIDs/Aspirin) specifically to be able to surf or manage post-surf pain.	1.29	N
6. Sleep Disturbance: Shoulder or arm pain from surfing prevented falling asleep or woke me up at night.	1.71	N
7. Daily Life Interference: Surfing injury made daily tasks (e.g., lifting bags, dressing) difficult or painful.	1.84	R
Grand Mean	**1.95**	**R**

Note. Verbal Interpretation (VI): 1.00–1.74 = Never (N); 1.75–2.49 = Rarely (R); 2.50–3.24 = Sometimes (S); 3.25–4.00 = Frequently (F).

As to individual indicators, Pain Post-Surf notably obtained the highest mean score (M = 2.51), making it the most noticeable impact of UE injuries. This suggests that surfers commonly experience pain or stiffness after a surfing session rather than during performance. This signifies that physical strain builds up during sessions due to paddling, which comprises up to 54% of time in water and becomes more noticeable after the session.

On the contrary, most of the indicators are in the Rarely category, which means that severe impacts of injury are not commonly experienced. Pain During Paddling (M = 2.31) does indicate ongoing biomechanical stress during the act of propulsion, but surfers adapt without ceasing. The prone paddling position demands prolonged shoulder flexion, internal rotation and engagement of the muscles of the rotator cuff, latissimus dorsi and pectoralis major, resulting in microtraumatic overload (Langenberg et al. 2021).

Technique Modification (M = 2.09) shows that few surfers modify their movement or take short breaks due to injury. (M=1.91) Session Shortening further indicates that longer-term absence from surfing due to injury is infrequent. Also, the Daily Life Interference (M = 1.84) scale shows that most injuries do not require professional care and rarely interfere with daily activities. The findings indicate that although injuries do happen, they are generally mild, manageable and have a minimal impact on the general activity of surfers.

The lower impact indicators of Self-Medication (M = 1.29) and Sleep Disturbance (M = 1.71), both in the Never category, indicate that UE injuries rarely result in significant functional limitations. Results show that surfers rarely take pain medication for surfing-related injuries and rarely experience pain that is severe enough to interfere with sleep.

Relationship Between Surfing Proficiency Level and Impact of Upper Extremity Injuries

Table 6 reports the relationship between surfing proficiency level and upper extremity injuries in terms of type of injury and impact of Injury on surfing proficiency. Since the data did not meet the assumption of normality using the Shapiro-Wilk test, a Spearman's Rank-Order Correlation was conducted to test the relationship of the mentioned variables.

Table 6: Relationship Between Surfing Proficiency Level and Type of Injury; Surfing Proficiency Level and Impact of UE injury on surfing proficiency

Variable	r_s	Strength of Relationship	p-value	Decision	Interpretation
Surfing Proficiency Level and Type of Injury	0.004	Very Weak/ Negligible Relationship	0.979	Accepted H_o	Not Significant
Surfing Proficiency Level and Impact of UE Injury on surfing proficiency	0.038	Very Weak/ Negligible Relationship	0.806	Accepted H_o	Not Significant

Note. r_s (Spearman's Rank-Order Correlation Coefficient); n (Sample size); p (Significance level); Strength of Relationship: ±0.01 – ±0.19 (Very Weak), ±0.20 – ±0.39 (Weak), ±0.40 – ±0.59 (Moderate), ±0.60 – ±0.79 (Strong), ±0.80 – ±0.99 (Very Strong)

Regarding the type of injury, the results reveal that there is no statistically significant relationship between surfing proficiency level and type of injury ($rs = 0.004, p = 0.979 > 0.05$). As a result, the decision is to accept the null hypothesis. The results show that the very weak correlation found was not significant, indicating that the level of expertise of a surfer does not affect the type of upper extremity injury that he or she will acquire. As noted, surfers of various skill levels tend to sustain the same sorts of injuries, and the minor differences observed are most probably the result of random variation rather than actual differences in surfing proficiency. This suggests that being more skilled or less skilled does not really change what kind of upper extremity injury a surfer may experience.

Similarly, in terms of impact of Injury on surfing proficiency, the results also show no statistically significant relationship between surfing proficiency level and impact of Injury on surfing proficiency ($rs = 0.038, p = 0.806 > 0.05$). Therefore, the decision is also to fail to reject the null hypothesis. This reflects that the weak relationship identified is also negligible and not significant. Fundamentally, the

data indicate that the consequences of upper extremity injuries do not vary significantly according to surfing proficiency. If the surfer is an intermediate, beginner, or advanced. The impact of injury is relatively similar across all skill levels as respondents from each skill cohort tended to report similar levels of injury related impact. Overall, there is no relationship between level of surfing proficiency and type or impact of upper extremity injuries. This indicates that the level of skill is not the only determining factor in the occurrence or consequences of injury.

Physical Therapy-Based Intervention Protocols

The findings of the study highlight the importance of implementing physical therapy-based intervention protocols to address the common upper extremity complaints experienced by surfers, particularly repetitive shoulder strain and post-surf pain associated with prolonged paddling activities. Although the results revealed that most injuries were only rarely experienced and generally had minimal impact on surfing performance, the consistent occurrence of rotator cuff strain and post-surf discomfort suggests the need for preventive and rehabilitative interventions to avoid progression into chronic musculoskeletal conditions.

Based on the findings, intervention protocols may focus on shoulder stability training, scapular strengthening, paddling endurance exercises, flexibility enhancement, and postural correction. Emphasis may also be placed on improving rotator cuff strength and muscular endurance to tolerate repetitive overhead movements involved in surfing. Exercises targeting the periscapular muscles, core stability, and thoracic mobility may further help improve paddling mechanics and reduce excessive stress on the shoulder complex.

In addition, stretching and mobility exercises for the shoulder girdle, cervical spine, thoracic spine, and upper extremities may be incorporated to minimize stiffness and improve movement efficiency during surfing sessions. Warm-up and cool-down protocols consisting of dynamic stretching, activation exercises, and recovery strategies may also be implemented before and after surfing to reduce fatigue-related strain and improve tissue recovery.

For surfers experiencing recurrent pain or early symptoms of overuse injury, physical therapists may provide individualized rehabilitation programs emphasizing pain management, gradual loading, activity modification, and correction of faulty movement patterns. Education regarding proper surfing biomechanics, pacing of surfing sessions, adequate rest, and recovery techniques may also help reduce the likelihood of recurrent injuries.

Furthermore, return-to-sport protocols may be developed to safely guide injured surfers back to surfing participation. These protocols may include progressive strengthening, endurance retraining, neuromuscular control exercises, sport-specific paddling drills, and gradual exposure to surfing activities according to the surfer's functional capacity and tolerance. Overall, these intervention protocols may contribute to improved surfing performance, reduced injury recurrence, and long-term musculoskeletal health among surfers in San Juan, La Union.

5. Discussion

Solid basic skills are common among surfers in San Juan, La Union, but they plateau in advanced skills. Injuries to the upper extremity are less common, but still occur, especially in the shoulder region that is related to repetitive paddling motions.

Level of surfing proficiency among surfers. The surfers were generally competent at basic and intermediate skills but less proficient at more advanced techniques, showing a plateau in higher-level performance. This means that the surfers have already developed strong foundational skills but need additional structured training and exposure to more difficult surfing conditions to move past basic proficiency.

Frequency of upper extremity injuries among surfers in terms of type. Upper extremity injuries were rare and mostly mild, with rotator cuff strain and post-surf pain as the most common complaints, suggesting that repetitive paddling was the main source of strain. San Juan, La Union, may have a low incidence of injuries because of the good conditions of the surf for beginners, breaks that match a surfer's skill, and seasonal variations in the waves that may help prevent uncontrolled falls and collisions.

Impact of upper extremity injury on the level of surfing proficiency among surfers. No significant association was found between injury type or severity and surfing skill level, indicating that the likelihood of injury cannot be explained by level of expertise alone. The even injury impact across groups in the local context may be explained by the use of skill-appropriate surf zones and a controlled learning environment. This means that for surfers in San Juan, low- and high-skill surfers still need the same injury-prevention habits because skill level alone does not protect against upper extremity strain.

6. Conclusion

Solid basic skills are common among surfers in San Juan, La Union, but they plateau in advanced skills. Injuries to the upper extremity are less common, but still occur, especially in the shoulder region that is related to repetitive paddling motions.

The surfers were generally competent at basic and intermediate skills but less proficient at more advanced techniques, showing a plateau in higher-level performance. This means that the surfers have already developed strong foundational skills but need additional structured training and exposure to more difficult surfing conditions to move past basic proficiency.

Upper extremity injuries were rare and mostly mild, with rotator cuff strain and post-surf pain as the most common complaints, suggesting that repetitive paddling was the main source of strain. San Juan, La Union, may have a low incidence of injuries because of the good conditions of the surf for beginners, breaks that match a surfer's skill, and seasonal variations in the waves that may help prevent uncontrolled falls and collisions.

Overall, no significant association was found between injury type or severity and surfing skill level, indicating that the likelihood of injury cannot be explained by level of expertise alone. The even injury impact across groups in the local context may be explained by the use of skill-appropriate surf zones and a controlled learning environment. This means that for surfers in San Juan, low- and high-skill surfers still need the same injury-prevention habits because skill level alone does not protect against upper extremity strain.

7. Acknowledgements

The researchers would like to offer their sincerest thanks to Almighty God for His constant guidance and countless blessings throughout the completion of this study. His presence served as the foundation and inspiration for the researchers in overcoming every challenge encountered during the process.

The researchers also extend their gratitude to the Dean of CPRT and Chairperson of the Panel, Mr. Maverick Kaypee Colet, for sharing his expertise, insightful recommendations, and constructive comments that contributed significantly to the improvement of this research.

Special appreciation is given to Ms. Rhaycy Lei Cabanela, PTRP, the research adviser, for her continuous support, guidance, and encouragement throughout the study. Her assistance during the data gathering and writing process, together with her dedication and motivation, greatly helped the researchers accomplish this research successfully. Likewise thankful to Ms. Jennifer Arquero, MBA, our research teacher, for her patience, and continuous guidance in refining and strengthening the study. Her knowledge and support became instrumental in the completion of this research.

The researchers would also like to express their heartfelt gratitude to the local surfers of La Union and Bacnotan who participated in this study. Their cooperation, time, and willingness to share their experiences played an essential role in making this research possible.

Finally, the researchers sincerely thank their families and friends for the financial, emotional, and moral support they generously provided throughout this journey. Their encouragement and understanding inspired the researchers to stay determined and finish the study successfully.

8. References

Alyafei, A., & Easton-Carr, R. (2024). *The health belief model of behavior change.* National Institutes of Health. https://www.ncbi.nlm.nih.gov/books/NBK606120/

Bae, M. (2024). Biopsychosocial approach to sports injury: A systematic review and exploration of knowledge structure. *BMC Sports Science, Medicine and Rehabilitation, 16*, 242. https://doi.org/10.1186/s13102-024-01025-x

Biscontini, T. (2022). *Surfing.* EBSCO Research Starters. https://www.ebsco.com/research-starters/oceanography/surfing

Bhandari, P. (2020, June 12). *Quantitative research.* Scribbr. https://www.scribbr.com/methodology/quantitative-research/

Borgonovo-Santos M, Telles T, Nessler J, de Castro MP, Fernandes RJ, Vilas-Boas JP. Are the Kinetics and Kinematics of the Surf Pop-Up Related to the Anthropometric Characteristics of the Surfer? Sensors (Basel). 2021 Mar 4;21(5):1783. doi: 10.3390/s21051783. PMID: 33806532; PMCID: PMC7961430.

Buszard T, Garofolini A, Reid M, Farrow D, Oppici L, Whiteside D. Scaling sports equipment for children promotes functional movement variability. Sci Rep. 2020 Feb 20;10(1):3111. doi: 10.1038/s41598-020-59475-5. PMID: 32080214; PMCID: PMC7033277.

Cucos, L. (2025, December 18). Cronbach's Alpha Interpretation. Uedufy. https://uedufy.com/how-to-interpret-cronbachs-alpha-results/

Donaldson, T., Scantlebury, M., Furness, J., Kemp-Smith, K., Newcomer, S., & Climstein, M. (2022). Training methods in the sport of surfing: A scoping review. *Strength and Conditioning Journal, 44*(3), 21–32. https://doi.org/10.1519/SSC.0000000000000674

Forsyth, J. R., Barnsley, G., Amirghasemi, M., Barthelemy, J., Elshahomi, A., Kosasih, B., Steele, J. R., & Panhuis, M. in het. (2024). Understanding the relationship between surfing performance and fin design. *Scientific Reports, 14*, 8734. https://doi.org/10.1038/s41598-024-58387-y

Francis, J. R. (2022, April 20). La Union Surf Guide - Beginner Haven of The Philippines. Surf Atlas. https://thesurfatlas.com/surfing-in-philippines/la-union-surf/

Furness, J., McArthur, K., Remnant, D., Jorgensen, D., Bacon, C. J., Moran, R. W., Hing, W., & Climstein, M. (2021). Traumatic surfing injuries in New Zealand: A descriptive epidemiology study. *PeerJ, 9*, e12334. https://doi.org/10.7717/peerj.12334

Hanchard, S., Duncan, A., Furness, J., Simas, V., Climstein, M., & Kemp-Smith, K. (2021). Chronic and gradual-onset injuries and conditions in the sport of surfing: A systematic review. *Sports, 9*(2), 23. https://doi.org/10.3390/sports9020023

Lee, J. H., Lee, H. C., Jeong, H. N., & Ha, M. S. (2024). Mediation effect of skill levels in relationship between degree of participation and injury experience on leisure sports participants. *Korean Journal of Sports Science, 35*(1), 170–180. https://doi.org/10.24985/kjss.2024.35.1.170

Liebert, P. L. (2025). *Overview of sports injuries.* MSD Manual. https://www.msdmanuals.com/home/injuries-and-poisoning/sports-injuries/overview-of-sports-injuries

Lima, G. V., Takeuchi, E., de Seixas, P. M. C., Rehder, A., Prada, M. V. P., Baboghluian, M., & Brech, G. C. (2025). Physical assessment in surfers: Guidelines for health professionals—Part 1: Upper quarter. *Revista Brasileira de Ortopedia, 33*(4). https://doi.org/10.1590/1413-785220253304e290571

Lowe, R. (2025, May 8). *Biopsychosocial model.* Physiopedia. https://www.physio-pedia.com/Biopsychosocial_Model

McArthur, K., Jorgensen, D., Climstein, M., & Furness, J. (2020). Epidemiology of acute injuries in surfing: A systematic review. *Sports, 8*(2), 25. https://doi.org/10.3390/sports8020025

McLeod, S. (2025, August 12). *Independent and dependent variables.* Simply Psychology. https://www.simplypsychology.org/variables.html

Memon, M. A., Ting, H., Cheah, J. H., Thurasamy, R., Chuah, F., & Cham, T. H. (2020). Sample size for survey research: Review and recommendations. *Journal of Applied Structural Equation Modeling, 4*(2). https://doi.org/10.47263/JASEM.4(2)01

Mejuto G, Gómez-Carmona CD, Gracia J, Rico-González M. Surfing Time-Motion Characteristics Possible to Gain Using Global Navigation Satellite Systems: A Systematic Review. Sensors (Basel). 2024 May 27;24(11):3455. doi: 10.3390/s24113455. PMID: 38894246; PMCID: PMC11174645.

Minasian, B., & Hope, N. (2021). Surfing on the world stage: Acute and overuse injuries and preventative measures. *British Journal of Sports Medicine, 56*(1). https://doi.org/10.1136/bjsports-2021-104307

Minkoff, E. C. (2023). Upper extremities. EBSCO. https://www.ebsco.com/research-starters/anatomy-and-physiology/upper-extremities

Miranda, G. E. (2022). The role of workload management in injury prevention, athletic, and academic performance in the student-athlete. *Journal of Sport Rehabilitation, 21*(6), 186–191. https://doi.org/10.1249/JSR.0000000000000964

Obana, K. K., Hasegawa, M. E., Mueller, J. D., Rimm, J. B., Lind, D. R. G., Berk, A. N., Saltzman, B. M., Parisien, R. L., Trofa, D. P., & Lee, L. S. K. (2023). Decreasing trend in upper extremity surfing injuries presenting to U.S. emergency departments. *Orthopaedic Journal of Sports Medicine, 11*(2), 45–59.

Oliveira, M. G., Takeuchi, E., Mezêncio, B., Santos, A. C., & Azevedo, A. P. S. (2024). Descriptive characterization of Brazilian surfers and their injuries. *Human Movement, 25*(3), 72–85. https://doi.org/10.5114/hm/190498

O'Reilly, N. (2024, August 8). *Sport injury classification.* Physiopedia. https://www.physio-pedia.com/Sport_Injury_Classification

Quismorio, E. (2025, July 5). *San Juan, La Union deserves to be tagged "Surfing Capital of the North," says Ortega.* Manila Bulletin.

https://mb.com.ph/2025/07/05/san-juan-la-union-deserves-to-be-tagged-surfing-capital-of-the-north-says-ortega/

Raimundi MJ, Celsi I, Pérez-Gaido M, Schmidt V, Castillo I, Alvarez O. Engagement in Youth Athletes as a Positive Experience in Sport: Implications of Gender, Age, and Competitive Level. Eur J Investig Health Psychol Educ. 2024 Jun 4;14(6):1597-1613. doi: 10.3390/ejihpe14060106. PMID: 38921072; PMCID: PMC11202957.

Re, C., Schmidt, D., Quartini, E., Dale, E., Newcomer, S. C., Furness, J., & Nessler, J. A. (2023). An investigation of scapular dyskinesis in recreational surfers and non-surfers. *Science Direct*, *2*, 100026. https://doi.org/10.1016/j.jsamspl.2023.100026

Remnant, D., Moran, R. W., Furness, J., Climstein, M., Hing, W. A., & Bacon, C. J. (2020). Gradual-onset surfing-related injuries in New Zealand. *Journal of Science and Medicine in Sport, 23*(11), 1049–1054. https://doi.org/10.1016/j.jsams.2020.05.010

Rominger, C. J., Schneider, M., Fink, A., Tran, U. S., Perchtold-Stefan, C. M., & Schwerdtfeger, A. R. (2022). Acute and chronic physical activity increases creative ideation performance: A systematic review and multilevel meta-analysis. Sports Medicine - Open, 8(1), 62. https://doi.org/10.1186/s40798-022-00444-9

Santisteban, A., Muñoz-Pérez, I., Río, X., & Sáez, I. (2024). Influence of technical skill level and sport specialization on surfing injuries. *Journal of Bodywork and Movement Therapies, 40*, 1140–1145. https://doi.org/10.1016/j.jbmt.2024.07.008

Singh, S. (2023, November 24). *What is descriptive research?* Researcher Life. https://researcher.life/blog/article/what-is-descriptive-research-definition-methods-types-and-examples/

Siregar, N. M., Sari, E. F. N., Budiningsih, M., Suryani, L., & Muslimin. (2022). Beginner level surf training model. *International Journal of Human Movement and Sports Sciences, 10*(6), 1217–1224. https://doi.org/10.13189/saj.2022.100613

The Best Time to Visit La Union: Seasons, Surf, and Sunsets. (2024, December 23). Fatwave Surf Resort. https://www.fatwavesurfresort.com/blog/the-best-time-to-visit-la-union-seasons-surf-and-sunsets

Trinidad, C. C. M. (2025, July 9). *La Union town bids to seize "Surfing Capital of the North" title.* Philippine Information Agency. https://pia.gov.ph/news/la-union-town-bids-to-seize-surfing-capital-of-the-north-title/

Tulloch, A. (2021, July 7). *Surfing explained: How the new Olympic sport is judged.* Olympics. https://www.olympics.com/en/news/surfing-explained-how-the-new-olympic-sport-is-judged

Van Der Sandt, M. J., Machado, M. L., Santos, C. C., & Costa, M. J. (2026). Biomechanical Perspectives on Surfing Performance: A Scoping Review. Biomechanics, 6(2), 36. https://doi.org/10.3390/biomechanics6020036

Wang, Z., Zhou, J., Ma, Y., Guo, Z., Jia, M., & Zheng, W. (2025). Effect of suspension training on the balance ability of surfers without relying on vision. *Frontiers in Physiology, 16*, 1594228. https://doi.org/10.3389/fphys.2025.1594228

9. Appendices

Appendix A

Approval Sheet from the Research Ethics Committee

LORMA
COLLEGES

LC-REC Form #024
APPROVAL LETTER

REC Reference #: 2026-100

February 23, 2026

To: **Vienna Grace Donor, Katrina Gaerlan, Frances Ruth Gaoiran and Saint Relly Bartfermil Landingin**
LORMA Colleges, College of Physical therapy

Subject: Approval of the Research Study – "SURFING PROFICIENCY LEVELS AND FREQUENCY OF UPPER EXTREMITY INJURIES IN SAN JUAN, LA UNION" – by the Research Ethics Committee (REC).

Dear Researcher/s,

The Research Ethics Committee (REC) has reviewed your application to conduct the above-mentioned research study in San Juan, La Union with you as the Principal Investigators within a duration of February 23, 2026 to February 23, 2027.

The Following documents have been reviewed and approved:

1. Endorsement of the Research Coordinator
2. Title and Statement of the Problem/Objective
3. Literature Review
4. Methods and Procedures
5. Population and Locale
6. Exclusion/Inclusion Criteria
7. Data Analysis
8. Ethical Considerations

We approve the study to be conducted in the presented form provided the following are integrated in the final research protocol:

1. In the Informed Consent Form's Confidentiality section, the location of the data storage should be specified (e.g, locked cabinet in a researcher's house/office, Google Drive, etc.).

The institutional REC expects to be informed about the progress of the study, any revision in the protocol before implementation and participants'/respondents' information/informed consent. Likewise, you are required to provide the Board a copy of the final report.

Yours Sincerely,

JEROME P. VERA, LPT
Chairman, LC-REC

Appendix B

10. Author(s) Biodata

Mr. Saint Relly Bartfermil A. Landingin, a dedicated Bachelor of Science in Physical Therapy student, collaborates with her passionate group members under the guidance of their research adviser in conducting a study focused on surfing-related injuries, surfers' practices, and their effects on surfing performance and overall well-being. Through their collaborative efforts, they aim to gain deeper insights into

injury patterns, safety awareness, and preventive strategies that may help promote safer and more sustainable surfing participation within the surfing community.