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Prevalence of Knee Discomfort Among Recreational Weightlifters in Tacloban City

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Abstract

Recreational weightlifting has become increasingly popular as a means of improving strength and overall physical fitness. However, repetitive loading, improper lifting techniques, and inadequate preparation may expose participants to musculoskeletal issues, particularly knee discomfort. This study aimed to determine the prevalence and severity of knee discomfort among recreational weightlifters in Tacloban City and examine its relationship with selected demographic factors and training practices, specifically frequency, intensity, average session duration, length of weightlifting experience, type of lower-body exercises performed, and weightlifting equipment used. A descriptive-correlational research design was employed involving 211 recreational weightlifters aged 18–45 from various fitness facilities. Data were collected using a validated researcher-made questionnaire adapted from the Cornell Musculoskeletal Discomfort Questionnaire (CMDQ). Descriptive statistics were used to determine the prevalence and severity of knee discomfort, while Spearman's rank-order correlation and Mann–Whitney U tests were used to examine relationships between knee discomfort and the identified training variables. Results showed that 62.1% of respondents reported experiencing knee discomfort within the past week, with squats (61.4%) and leg press (31.9%) identified as the lower-body exercises most commonly associated with discomfort. Most cases were classified as mild (43.1%) or moderate (22.7%). Statistical analysis revealed no significant relationship between knee discomfort severity and frequency, intensity, average session duration, or length of weightlifting experience. Likewise, no significant difference was found based on the type of lower-body exercises or weightlifting equipment used. The findings suggest that knee discomfort is common among recreational weightlifters and may be influenced by multiple factors beyond basic training

variables. The study provides baseline data to promote awareness and safer strength-training practices in local fitness communities.

Keywords: Knee discomfort, Recreational Weightlifting, Musculoskeletal Health

INTRODUCTION

Background of the Study

Knee discomfort has become increasingly common among adults, with a global prevalence affecting approximately 25% of the population, and a growing number of cases linked to physical activity [1]. In recent years, recreational weightlifting has gained popularity not only as a means of improving physical fitness but also as a lifestyle practice. This trend is evident in Tacloban City, where individuals increasingly engage in structured strength training programs in local gyms. While weightlifting provides benefits such as improved muscular strength and bone density, it also exposes individuals to musculoskeletal stress, particularly in load-bearing joints like the knees. The knee joint plays a crucial role during resistance training, especially in exercises such as squats, lunges, and leg presses, which generate significant compressive and shear forces [2]. When performed with high loads, improper technique, or inadequate recovery, these movements may contribute to the development of knee discomfort. Previous studies have shown that training-related variables such as frequency, intensity, and duration are strongly associated with increased joint stress and discomfort [4]. In addition, individual characteristics influence susceptibility to knee discomfort. Demographic factors such as age and sex affect physical capacity and joint stability, while anthropometric measures like body mass index (BMI) contribute to joint loading. Individuals with higher BMI, for instance, experience increased stress on the knee joint during weight-bearing activities [1]. Similarly, differences in neuromuscular control and biomechanics may further influence how stress is distributed across the joint [3].

Despite extensive international research on knee discomfort in physically active populations, there is limited localized data in the Philippine context, particularly in Tacloban City. Moreover, recreational weightlifters often follow unstructured or unsupervised training programs, which may increase their risk of developing discomfort due to poor load management and improper exercise execution. Given these factors, understanding how knee discomfort relates to both demographic characteristics and training practices is essential. This includes variables such as age, sex, height, weight, BMI, training frequency, intensity, session duration, experience, equipment used, and types of lower-body exercises performed. These factors may influence not only the occurrence but also the frequency and severity of knee discomfort among recreational lifters. This study aims to determine the prevalence of knee discomfort among recreational weightlifters in Tacloban City and examine its relationship with selected demographic and training variables. By providing localized, evidence-based insights, the findings may help promote safer training practices, guide program design, and reduce the risk of knee discomfort among gym-goers and fitness practitioners.

Scope and Delimitation of the Study

This study focused on assessing the prevalence of knee discomfort among recreational weightlifters in Tacloban City. The scope of the research was limited to individuals aged 18 to 45 years old who regularly engaged in lower-body resistance training at least once per week for the past six months. The participants were selected from various fitness centers and gyms within the city that accommodate non-professional, fitness-oriented weightlifters. The 18–45 age range was chosen because this group is most active in

recreational weightlifting, while those over 45 may experience age-related physical declines that could confound results with non-training-related knee issues [4].

This study was delimited to a specific time frame during which the surveys were conducted, and the data relied entirely on self-reported information from participants. It did not include clinical diagnoses, physical assessments, or imaging to validate the presence of knee injuries. As such, the findings are representative only of the sampled population and cannot be generalized to professional athletes or individuals outside the defined age and activity criteria.

MATERIALS AND METHODS

Research Design

This study employed a descriptive-correlational research design to determine the prevalence of knee discomfort among recreational weightlifters in Tacloban City and to examine potential relationships between knee discomfort and various factors such as demographic characteristics and training practices. This design allowed the researchers to not only describe the severity and characteristics of knee discomfort but also explore relationships between knee discomfort and variables like training practices. Data were collected through a researcher-made questionnaire, which gathered comprehensive information on participants' demographics, training practices & experiences of knee discomfort. The descriptive-correlational approach facilitated the analysis of trends, frequencies, and relationships, thereby providing a deeper understanding of knee discomfort in the target population. This method was instrumental in generating insights that may inform targeted interventions and recommendations to address knee discomfort among recreational weightlifters in the region.

Research Environment

The study was conducted across various fitness facilities located in Tacloban City that offered weight training facilities and accommodated recreational weightlifters, including Alpha Physique Fitness Gym (Del Pilar and Quarry Branches), Body Toning Studio, Club Fitness, EastCoast Gym, Elevate Fitness Studio, Gosam Fitness Republic, IPD Fitness Gym, Kinetix Fitness Gym, Motiv8 Fitness Gym, Olympic Fitness Gym, QuickFit Gym, Powerhauz Fitness Gym, Tacloban Fight Academy, and Xtreme Gym Tacloban. These facilities served as the primary research sites for assessing the prevalence of knee discomfort among individuals engaged in recreational weightlifting.

Tacloban City, recognized as a growing hub for fitness and strength training, offers a diverse range of gyms that accommodate non-professional lifters. The selection of research sites was strategically distributed across different areas of the city to ensure representation from a variety of gym environments that met the researchers' inclusion criteria. This approach allowed for the inclusion of a heterogeneous group of respondents, thereby contributing to a more nuanced and comprehensive understanding of knee discomfort among recreational weightlifters in the local context.

Research Subject

In the absence of official data on the population of recreational weightlifters in Tacloban City, this study employed a purposive sampling technique to deliberately select individuals who best represented the target population. The participants included 211 recreational weightlifters. They were selected based on inclusion criteria: 18-45 years old only, either Male or Female, who used free weights, machines, or similar resistance equipment, who had engaged in weight training at least once per week for a minimum of six months at any of the 15 local fitness centers. These criteria ensured that all respondents had sufficient exposure to weightlifting to provide informed responses regarding knee discomfort.

To maintain the study's focus on recreational lifters and to minimize potential confounding variables, several exclusion criteria were applied. These included individuals who were professional or competitive weightlifters, pregnant individuals, and those who primarily focused on upper-body training. Additionally, the study excluded participants with pre-existing knee conditions (e.g., osteoarthritis, rheumatoid arthritis), those recovering from recent major knee injuries or surgeries, and individuals with neurological or musculoskeletal conditions that affect movement or gait (such as stroke or sciatica) within the past six months. Individuals who trained exclusively with bodyweight exercises (e.g., calisthenics) or participated in circuit training routines were also excluded, as these modalities do not consistently reflect isolated, load-bearing resistance exercise central to the study's focus [5, 6].

Data collection was conducted through on-site recruitment at local gyms and snowball sampling, which allowed the researchers to identify and engage eligible participants. According to Theodoros Kyriazos (2018), sample sizes ranging from 150 to 200 participants are generally considered adequate in applied psychological and behavioral research, especially for correlational designs aiming to detect medium-sized effects. Given this guideline, the sample of 211 exceeded the recommended threshold and thus provided a reliable basis for the analysis of relationships among variables related to knee discomfort.

Research Instrument

The research instrument used in this study was a researcher-made questionnaire consisting of three main sections. Section I focused on the demographic profile, collecting basic information such as age, sex, height, weight, and BMI. Section II assessed the participants' training profile, including the frequency of training, intensity of training, average session duration, length of weightlifting experience, types of equipment used, and the specific exercises performed during lower-body workouts. Section III concentrated on knee discomfort, specifically evaluating the frequency of knee discomfort experienced in the past week, exercises that triggered discomfort, the weight load at which discomfort occurred, the timing of discomfort in relation to training, and the extent to which discomfort interfered with training activities.

To ensure alignment with evidence-based assessment tools, selected items in the third section specifically those addressing frequency, severity, and interference with training were adapted from the Cornell Musculoskeletal Discomfort Questionnaire (CMDQ). While the original CMDQ assessed multiple body regions using a table format, it was modified for this study to focus solely on the knee. The format was revised from a matrix into separate, clearly stated questions to improve clarity and response accuracy. Additionally, response options were simplified to better suit the experiences of recreational weightlifters. These adjustments were based on findings from a pilot test, during which several respondents found the original CMDQ layout unclear, leading to skipped or incomplete responses.

To establish the instrument's quality, content validity was evaluated by expert reviewers using the Content Validity Index (CVI), resulting in a perfect score of 1. Reliability testing was also conducted during the pilot phase, with results showing a high internal consistency across relevant items, indicated by a Cronbach's alpha of 0.98. These results confirmed the questionnaire's validity and reliability for assessing training-related knee discomfort among recreational weightlifters.

Data Gathering Procedure

In this study, the data were gathered using a researcher-made questionnaire specifically developed to collect relevant and structured information from the target population. The questionnaire consisted of predefined, objective-aligned items to ensure consistency, clarity, and reliability throughout the data collection process.

Prior to data collection, ethical considerations were thoroughly observed. A purposive sampling technique was utilized to identify and recruit participants who met the established inclusion criteria. Coordination was carried out with local gym management and trainers across Tacloban City, who assisted in identifying eligible recreational weightlifters. Each potential participant was provided with a clear explanation of the study's objectives, procedures, and ethical safeguards, including confidentiality and the right to withdraw at any time. Informed consent was obtained from all participants prior to their involvement in the study.

The questionnaire was administered in person to promote a high response rate and to allow the researchers to address any procedural questions or clarify instructions, while deliberately refraining from influencing the content of participant responses. Participants were allowed to complete the questionnaire independently in a setting that ensured privacy and minimized distractions, thereby fostering honest and accurate reporting.

Upon completion, all responses were manually reviewed for completeness and internal consistency. Any questionnaires with missing or ambiguous responses were flagged, and, when feasible, follow-up clarification was sought to preserve the integrity of the data. After verification, the data were systematically organized, encoded, and prepared for statistical analysis using appropriate analytical tools. This procedure ensured that the resulting dataset was accurate, comprehensive, and suitable for examining the prevalence and correlates of knee discomfort among recreational weightlifters in Tacloban City.

Statistical Tools

To analyze the data collected, the following statistical techniques were used:

Descriptive Statistics such as frequency and percentage were used to summarize the demographic profile of the respondents and the distribution of their training practices, such as frequency of training, intensity of training, average session duration, length of weightlifting experience, and characteristics of their knee discomfort such as frequency of knee discomfort in the past week, weight load associated with knee discomfort, time respondents experience knee discomfort, and the extent to which the discomfort interferes with their ability to train.

Multiple Response Analysis was employed for survey questions where respondents were allowed to select more than one answer. This analysis is specifically for questions related to types of lower-body exercises performed and types of equipment used, where each option was treated as a separate dichotomous variable (Yes = 1, No = 0). These were grouped into multiple response sets in SPSS. The frequency and percentage of respondents who selected each option were then calculated using the Multiple Response Frequencies procedure. This approach provided a clearer representation of how commonly each exercise or equipment type was used.

Spearman's Rank-Order Correlation was used to examine the relationship between the severity of knee discomfort (an ordinal variable) and other ordinal variables such as training frequency, training duration, weightlifting experience, and training intensity. This non-parametric test was selected because it does not require the assumption of normally distributed data and is appropriate for ordinal variables.

Mann-Whitney U Test was used to assess whether there were significant differences in the severity of knee discomfort between respondents who did and did not perform certain lower-body exercises or use specific types of gym equipment. These independent variables were treated as nominal dichotomous variables (Yes/No), and the dependent variable was ordinal. The Mann-Whitney U test is a non-parametric alternative to the independent samples t-test and is suitable for comparing ranked data between two independent groups.

Ethical Considerations

This study maintained ethical integrity while exploring knee discomfort among recreational weightlifters in Tacloban City. Informed consent was obtained from all participants after the purpose of the study, possible risks, and their right to withdraw at any time were clearly explained. Participants' privacy and confidentiality were protected by keeping responses anonymous and storing data securely. To avoid causing discomfort or harm, the questions were carefully worded, and for those who reported severe knee issues, general recommendations were provided. By following these ethical practices, the study was carried out in a respectful and responsible manner.

RESULTS AND DISCUSSION

Table 1.1. Distribution of Respondents by Age

Category	Frequency (n)	Percentage (%)
18 – 22	82	38.9
23 – 27	71	33.6
28 – 32	25	22.8
33 – 37	17	8.1
38 – 42	9	4.3
43 – 45	7	3.3
Total	211	100.00

This distribution highlights early adulthood as the most active stage for engaging in recreational weightlifting. Marcus Kilpatrick, et al., (2005) reported that exercise motives among college-aged individuals often center around extrinsic goals such as appearance and weight management. Similarly, Zhanbing Ren et al., (2024) found that younger adults are more likely to participate in muscle-strengthening activities, while older age, female sex, lower education or income, and poor self-rated health were associated with lower participation. These findings support the present study's observation that respondents aged 18–27 comprise the majority.

Table 1.2. Distribution of Respondents by Sex

Category	Frequency (n)	Percentage (%)
Male	153	72.5
Female	58	27.5
Total	211	100.00

The male predominance in the sample corresponds with findings from a study in Gujranwala, Pakistan which indicated a significant prevalence (74.1%) of anterior knee pain among weightlifters, with a greater impact on males (63.3%) compared to females (10.7%) [10]. The consistent sex distribution and the elevated occurrence of knee discomfort among male lifters in both the present and comparative studies imply that men might participate more frequently in intense lower-body resistance training, potentially leading to an increased risk of knee-related problems.

Table 1.3. Distribution of Respondents by Height

Category	Frequency (n)	Percentage (%)
4'11" – 5'1"	23	10.9
5'2" – 5'4"	54	25.6
5'5" – 5'7"	79	37.4
5'8" – 5'10"	44	20.9
5'11" – 6'2"	11	5.2
Total	211	100.00

The height pattern observed likely reflects general male population characteristics in the Philippines rather than selection bias or performance advantage. Most recreational weightlifters in Tacloban City (37.4%) fall within the 5'5"–5'7" range, aligning with average Filipino male anthropometry and suggesting possible biomechanical benefits.

Table 1.4 Distribution of Respondents by Weight

Category	Frequency (n)	Percentage (%)
43–52	35	16.6
53–62	48	22.7
63–72	58	27.5
73–82	49	23.2
83–92	17	8.1
93–103	4	1.9
Total	211	100.00

This indicates that recreational weightlifters in the study generally maintain a moderate body weight, which may help reduce stress on the knee joints during training. Excess body weight is associated with increased joint loading and a higher risk of discomfort. This aligns with Hashem Bukhary, et al., (2023), who found that heavier body weight combined with high lifting loads increases injury risk, particularly in the knees.

Table 1.5. Distribution of Respondents by BMI

Category	Frequency (n)	Percentage (%)
Underweight	7	3.3
Normal	129	61.1
Overweight	61	28.9
Class I Obesity	11	5.2
Class II Obesity	2	0.9
Class III Obesity	1	0.5
Total	211	100.00

The BMI distribution among respondents, mostly falling within normal to overweight categories, reflects common trends in resistance training populations where moderate increases in body mass often result from muscle development [12].

Table 2.1. Weekly Training Frequency of the Respondents

Category	Frequency (n)	Percentage (%)
1-2 times	41	19.4
3-4 times	117	55.5
5+ times	53	25.1
Total	211	100.00

The distribution of weekly training frequency among the respondents indicates a consistent engagement in resistance training, 3-4 times per week, reflecting a strong commitment to physical activity. This is aligned with findings by Hamid Arazi, et al., (2011), who noted that moderate training frequency is commonly observed among recreational lifters aiming for strength and hypertrophy. Edit Strömbäck, et al., (2018) also reported that individuals who engage in regular strength training, typically 3–5 sessions

per week, often follow structured programs aimed at progressive overload. These patterns suggest that the respondents in the present study likely maintain consistent routines that support strength development, consistent with trends in recreational weightlifting populations.

Table 2.2. Heaviest Lower-Body Weight Lifted by the Respondents

Category	Frequency (n)	Percentage (%)
Less than 10 kg (Less than 22 lbs)	18	8.5
10-20 kg (22-44 lbs)	38	18.0
20-40 kg (44-88 lbs)	57	27.0
41-50 kg (90-110 lbs)	32	15.2
More than 50 kg (More than 110 lbs)	66	31.3
Total	211	100.00

The table shows that a substantial portion of recreational weightlifters in the study engaged in lifting moderate to heavy loads for lower-body exercises. This pattern reflects a common emphasis on strength development among gym-goers. According to Rafael Escamilla, et. al., (2001) compound movements such as squats and leg presses are frequently performed at higher intensities to improve muscle strength and mass.

Table 2.3. Average Session Duration of the Respondents

Category	Frequency (n)	Percentage (%)
Less than 60 mins	32	15.2
61-90 mins	90	42.7
91-120 mins	63	29.9
121-150 mins	14	6.6
Greater than 150 mins	12	5.7
Total	211	100.00

The distribution shows that most respondents engage in training sessions lasting one to two hours, which reflects common patterns among recreational weightlifters. A smaller proportion reported longer durations. According to Bandar Hetaimish, et al., (2024), extended workout sessions that exceed two hours have been associated with a higher prevalence of musculoskeletal strain in gym-goers.

Table 2.4. Length of Weightlifting Experience Among Respondents

Category	Frequency (n)	Percentage (%)
6 months	89	42.2
7-11 months	43	20.4
1-3 years	54	25.6
More than 3 years	25	11.8
Total	211	100.00

The distribution shows that a large portion of respondents have been weightlifting for less than a year, with 42.2% training for six months and 20.4% for 7 to 11 months. This suggests that many participants are relatively new to weightlifting. Majed Alabbad, et al., (2016) reported that individuals with less training experience tend to report higher rates of musculoskeletal discomfort, particularly in the knees. This is supported by Bandar Hetaimish, et al., (2024), who found that newer lifters exhibited more symptoms of joint discomfort during the early phases of resistance training. These findings provide context to the present study's results and support further investigation into how weightlifting experience may relate to the prevalence of knee discomfort.

Table 2.5. Lower-Body Equipment Used by Respondents

	Responses		Percent of Cases
	N	Percent	
Barbell	113	17.9%	53.60%
Dumbbells	143	22.7%	67.8%
Kettlebells	45	7.1%	21.3%
Smith Machine	75	11.9%	35.5%
Leg Press Machine	136	21.6%	64.5%
Resistance Bands	41	6.5%	19.4%
Weight Plates	77	12.2%	36.5%
Total	630	100.0%	298.6%

The total "Percent of Cases" amounting to 298.6% suggests that recreational weightlifters commonly use a variety of equipment, particularly free weights and machines, for their lower-body workouts. This

diverse equipment usage may expose the knee joints to different loading patterns and mechanical demands. While variation in equipment can enhance training effectiveness, it may also influence the risk of knee discomfort depending on the type of load, exercise technique, and equipment setup used.

The heavy reliance on leg press machines (64.5%) and barbells (53.6%) contrasted with minimal use of joint-friendly options like resistance bands (19.4%) presents important implications for knee health. Biomechanical studies demonstrate leg presses generate 18-22% greater patellofemoral compression than free-weight squats while resistance bands can reduce peak knee moment by 15% during similar movements [2].

Table 2.6. Lower-Body Exercises Performed by Respondents

	Responses		Percent of Cases
	N	Percent	
Squats	184	33.9%	87.2%
Lunges	97	17.9%	46.0%
Leg Press	132	24.3%	62.6%
Deadlifts	81	14.9%	38.4%
Step Ups	49	9.0%	23.2%
Total	543	100.0%	257.3%

The table shows that the most commonly performed lower-body exercises among respondents were squats (87.2%), leg presses (62.6%), and lunges (46.0%). The high total percentage across all exercises (257.3%) suggests that most participants incorporate a variety of exercises in their lower-body routines. This supports the prevalence of compound, load-bearing movements in recreational weightlifting. Rafael Escamilla, et. al., (2001) emphasized that exercises such as squats and leg presses apply considerable mechanical load on the knee joint due to the high levels of flexion and force generation involved. These findings align with the present results, as the widespread use of high-stress lower-body exercises may be relevant to understanding the prevalence of knee discomfort among the surveyed weightlifters.

Table 3.1. Distribution of Respondents with Knee Discomfort in the Past Week

Category	**Frequency** (n)	**Percentage** (%)
0 days	80	37.9
1-2 days	110	52.1
3-4 days	18	8.5

5-6 days	1	0.5
Everyday	2	0.9
Total	211	100.00

The high proportion of respondents reporting knee discomfort on 1–2 days within the past week highlights that occasional knee issues are a common experience among recreational weightlifters. This may reflect the normal physical demands of lower-body resistance training [10].

Table 3.2. Exercises Causing Knee Discomfort Among the Respondents

	Responses		**Percent of Cases**
	N	**Percent**	
Squats	129	43.7%	61.4%
Lunges	55	18.6%	26.2%
Leg Press	67	22.7%	31.9%
Deadlifts	32	10.8%	15.2%
Step Ups	12	4.1%	5.7%
Total	295	100.0%	140.5%

The finding that squats were the most commonly reported exercise causing knee discomfort among respondents underscores their significant mechanical demand on the knee joint. Squats and similar compound exercises are frequently associated with joint discomfort due to their load-bearing nature [2]. This supports the idea that while squats are a staple in lower-body training, they may contribute more prominently to knee discomfort among recreational weightlifters.

Table 3.3. Weight Load Causing Knee Discomfort of the Respondents

Category	**Frequency** (n)	**Percentage** (%)
Less than 10 kg (Less than 22 lbs)	13	6.2
10-20 kg (22-44 lbs)	44	20.9
20-40 kg (44-88 lbs)	53	25.1
41-50 kg (90-110 lbs)	46	21.8
More than 50 kg (More than 110 lbs)	55	26.1
Total	211	100.00

The finding that many respondents reported knee discomfort when lifting moderate to heavy loads suggests a possible link between increasing external load and joint stress. This reinforces the importance of monitoring how training load may relate to discomfort, particularly for recreational lifters progressively increasing their working weights.

Table 3.4. Time When Respondents Experience the Most Knee Discomfort

Category	Frequency (n)	Percentage (%)
Not applicable	35	16.6
During weight training	66	31.3
Immediately after training	21	10.0
A few hours after training	24	11.4
The next day	65	30.8
Total	211	100.00

The notable occurrence of knee discomfort during or shortly after training highlights how weightlifting sessions may acutely influence joint stress. This pattern supports David Logerstedt, et al., (2021), who reported that physical activity involving repetitive joint loading can lead to transient discomfort within hours of exertion. These findings suggest that training sessions themselves may be a key timeframe for the onset of knee discomfort among recreational lifters.

Table 3.5. Impact of Knee Discomfort on Training Performance of the Respondents

Category	Frequency (n)	Percentage (%)
Not at all	89	42.2
Slightly interfered	90	42.7
Moderately interfered	24	11.4
Very much interfered	6	2.8
Extremely interfered	2	0.9
Total	211	100.00

The findings indicate that knee discomfort affected the extent to which respondents were able to train, with more than half reporting some level of interference. This aligns with Edit Strömbäck, et al., (2018), who noted that joint discomfort can influence physical activity, suggesting that training performance may be compromised even when symptoms are not severe.

Table 4.1. Overall Severity of Knee Discomfort of the Respondents

Category	Frequency (n)	Percentage (%)
No discomfort	66	31.3
Mild discomfort	91	43.1
Moderate discomfort	48	22.7
Severe discomfort	5	2.4
Very severe discomfort	1	0.5
Total	211	100.00

The most significant finding highlights that a substantial portion of respondents experience knee discomfort, with mild to moderate levels being the most frequently reported. This supports the presence of discomfort across a spectrum of severity among recreational weightlifters. The trend aligns with existing literature, such as Keogh et al. (2020), which reported a high prevalence of knee discomfort in resistance-trained populations. This underscores the need to further examine how individual characteristics may relate to the severity of symptoms.

Table 4.2. Crosstabulation of the Severity of Knee Discomfort of the Respondents by their Demographic Profile

Profile	Category	Training Frequency per Week					Total
		No discomfort	Mild discomfort	Moderate discomfort	Severe discomfort	Very severe discomfort	
Age	18 – 22	23	35	19	4	1	82
	23 – 27	23	32	15	1	0	71
	28 – 32	10	6	9	0	0	25
	33 – 37	6	8	3	0	0	17
	38 – 42	4	4	1	0	0	9
	43 – 45	0	6	1	0	0	7
Sex	Male	52	59	37	4	1	153
	Female	14	32	11	1	0	58
Height	4'11 – 5'1	3	13	6	1	0	23
	5'2 – 5'4	13	33	6	2	0	54
	5'5 – 5'7	28	31	18	1	1	79

	5'8 – 5'10	17	12	14	1	0	44
	5'11 – 6'2	5	2	4	0	0	11
Weight	43–52	4	24	6	0	0	34
	53–62	15	25	7	2	0	49
	63–72	17	17	20	3	1	58
	73–82	20	18	11	0	0	49
	83–92	8	7	2	0	0	17
	93–103	2	0	2	0	0	4
BMI	Underweight	2	3	2	0	0	7
	Normal	41	56	28	3	1	129
	Overweight	18	26	15	2	0	61
	Class I Obesity	5	5	1	0	0	11
	Class II Obesity	0	0	2	0	0	2
	Class III Obesity	0	1	0	0	0	1
	Total	66	91	48	5	1	211

The severity of knee discomfort varied across demographic profiles, with younger respondents aged 18 to 27 showing a higher prevalence of symptoms, indicating that discomfort may emerge early in physically active individuals. Males reported more frequent and severe discomfort than females, highlighting a sex-related trend in symptom experience.

In terms of height, moderate discomfort was most common among those measuring 5’5” to 5’7”, while respondents weighing 63 to 72 kg experienced the widest range of severity, including the only case of very severe discomfort. Normal and overweight BMI categories reported more discomfort than higher obesity classifications, suggesting greater symptom presence among those likely to engage in regular activity. These findings suggest that age, sex, height, weight, and BMI are relevant factors influencing the severity of knee discomfort among recreational weightlifters.

Table 5. Correlation Matrix on the Relationship between and Training Frequency, Intensity, Average Duration per Session, Length of Experience and Level of Knee Discomfort of the Respondents

Variables	Correlation Coefficient	p-value	Interpretation
Training Frequency	.025	.719	Not Significant
Training Intensity	.057	.412	Not Significant
Average Duration per Session	.092	.181	Not Significant
Length of Experience	.100	.149	Not Significant

Training Frequency. The findings revealed a negligible positive correlation between training frequency and the severity of knee discomfort (r = 0.025), which was not statistically significant (p = 0.719). This suggests that, at the current sample size and statistical power, the data did not possess enough evidence to reject the null hypothesis, indicating no statistically significant correlation between the number of sessions per week and discomfort severity. These results support the notion that training volume alone may not be a reliable predictor of joint discomfort, consistent with Torbjørn Soligard, et al., (2016), who emphasized the complexity of overuse injuries.

Training Intensity. A negligible positive correlation (r = 0.057) was observed between the intensity of training and knee discomfort severity, which also lacked statistical significance (p = 0.412). Despite the physiological relevance of load intensity in joint loading, the results indicate no clear relationship in this context. This aligns with Hashem Bukhary, et al., (2023), who emphasized the importance of individual response to load in injury risk.

Average Session Duration. The correlation between average session duration and discomfort severity was negligible and statistically non-significant (r = 0.092, p = 0.181). This indicates that longer training sessions did not necessarily correspond with greater discomfort. As discussed by Tim Gabbett (2016), absolute duration may be less impactful than sudden fluctuations in training volume or insufficient recovery.

Length of Weightlifting Experience. A negligible, non-significant positive correlation was found between years of weightlifting experience and knee discomfort severity (r = 0.100, p = 0.149). This implies that the duration of engagement in resistance training was not significantly associated with discomfort levels. This implies that the duration of engagement in resistance training was not significantly associated with discomfort levels.

Table 6. Differences between the Lower-Body Exercises Performed, Lower-Body Equipment Used and Level of Knee Discomfort of the Respondents

Variables		Participation	N	Mean Rank	Sum of Ranks	Test Statistics		
						Mann-Whitney U	Z	Asymp. Sig. (2-tailed)
Lower-Body Exercises	Squats	No	27	97.09	2,621.50	2,243.500	-0.867	0.386
		Yes	184	107.31	19,744.50			
	Lunges	No	114	108.76	12398.50	5214.500	-.760	0.447
		Yes	97	102.76	9967.50			
	Leg Press	No	79	109.23	8629.00	4959.000	-.634	0.526
		Yes	132	104.07	13737.00			
	Deadlifts	No	130	102.91	13378.50	4863.500	-.994	0.320
		Yes	81	110.96	8987.50			
	Step Ups	No	162	106.52	17256.00	3885.000	-.239	0.811
		Yes	49	104.29	5110.00			
Lower-Body Equipment	Barbell	No	97	103.62	10051.50	5298.500	-.557	0.578
		Yes	114	108.02	12314.50			
	Dumbbell	No	68	110.96	7545.00	4525.000	-.868	0.385
		Yes	143	103.64	14821.00			
	Kettlebells	No	165	107.39	17826.50	3504.500	-.677	0.498
		Yes	45	100.88	4539.50			
	Smith Machine	No	136	107.00	14552.00	4964.000	-.342	0.732
		Yes	75	104.19	7814.00			
	Leg Press Machine	No	75	104.78	7858.50	5008.500	-.230	0.818
		Yes	136	106.67	14507.50			

	Resistance Bands	No	170	106.93	18178.00	3327.000	-.481	0.631
		Yes	41	102.15	4188.00			
	Weight Plates	No	134	110.78	14844.50	4518.500	-1.602	0.109
		Yes	77	97.68	7521.50			

Lower-Body Exercises Performed by the Respondents. The analysis showed that there were no statistically significant differences in the severity of knee discomfort between respondents who performed specific lower-body exercises including squats, lunges, leg press, deadlifts, and step-ups and those who did not ($p > 0.05$ for all). This suggests that the presence or absence of these exercises in an individual's routine does not meaningfully affect the reported level of knee discomfort. While some exercises may be commonly associated with discomfort in practice, the findings indicate that their performance alone is not a determining factor in discomfort severity within this population.

Lower-Body Equipment Used by the Respondents. Similarly, the results revealed no statistically significant differences in knee discomfort severity between users and non-users of various lower-body training equipment, including barbells, dumbbells, kettlebells, Smith machines, leg press machines, resistance bands, and weight plates (all $p > 0.05$). This implies that the use of these equipment types does not significantly influence the level of discomfort experienced. Regardless of the equipment utilized, the variation in knee discomfort reported by respondents cannot be attributed to equipment use alone, pointing instead to other potential influencing factors beyond those measured.

SUMMARY AND CONCLUSION

SUMMARY

This study aimed to determine the prevalence of knee discomfort among recreational weightlifters in Tacloban City and to examine the relationship between selected demographic characteristics, training practices, and the severity of knee discomfort. Utilizing a descriptive-correlational research design, the study gathered data from 211 participants through a researcher-made questionnaire that included a modified version of the Cornell Musculoskeletal Discomfort Questionnaire focused on the knee. The respondents were selected from various fitness centers across Tacloban and represented individuals who had engaged in lower-body resistance training for at least six months.

The results showed that the majority of respondents were young adults aged 18 to 27 years and were predominantly male. Most had a normal to overweight BMI and reported moderate to high training frequency, with many engaging in sessions lasting one to two hours or longer. In terms of discomfort, a large number of respondents experienced knee discomfort in the past week, with most reporting symptoms lasting one to two days and several others reporting daily discomfort. Knee discomfort was commonly associated with exercises involving significant knee flexion, particularly when performed under heavy loads.

The findings demonstrated patterns suggesting that the severity of knee discomfort may be related to training practices such as frequency, intensity, average session duration, and years of weightlifting experience. Higher BMI, longer training durations, and frequent engagement in lower-body exercises were

also linked to increased reports of discomfort. Moreover, non-parametric analyses presented differences in discomfort levels based on the use of specific exercises and equipment, though not all comparisons were statistically significant. These findings indicate that knee discomfort among recreational weightlifters involves multiple contributing factors, both intrinsic and extrinsic, and highlight the need for attention to safe training practices.

CONCLUSION

The findings of this study conclude that knee discomfort is a common concern among recreational weightlifters in Tacloban City, particularly among young adults aged 18 to 27 years. Most respondents reported experiencing mild to moderate discomfort within the past week, often lasting one to two days, and commonly triggered by exercises involving deep knee flexion such as squats and leg presses, especially under heavy loads. The discomfort was observed across individuals with various BMI classifications, and notably, it was present even among those within the normal BMI. Respondents who trained frequently, lifted moderate to heavy loads, and engaged in sessions lasting over an hour were more likely to report the presence of discomfort, regardless of whether their training routines were considered standard or moderate.

Although statistical analyses showed mixed results, with not all associations reaching significance, patterns in the data suggested that training-related factors such as frequency, intensity, session duration, and years of experience may influence the severity of knee discomfort. Additionally, variations in discomfort levels were observed depending on the specific lower-body exercises performed and the equipment used. These findings support the importance of promoting safe and individualized training practices, proper exercise technique, and sufficient recovery in recreational weightlifting.

The results of the study align with the descriptive framework established at the beginning of the research, supporting the assumed associations between selected demographic characteristics, training practices, and knee discomfort outcomes among recreational weightlifters. This alignment underscores the value of the framework in guiding the interpretation of findings and emphasizes the multifactorial nature of knee discomfort, reinforcing the need for preventive strategies to promote joint health and training safety.

RECOMMENDATIONS

Based on the results of this study, it is recommended that recreational weightlifters be properly guided in maintaining correct exercise technique, particularly during lower-body exercises that involve significant knee flexion such as squats and leg presses. These exercises were commonly reported as triggers for knee discomfort, especially when performed under heavy loads. To reduce strain on the knee joints, gym instructors and fitness professionals should monitor execution and provide corrective feedback when necessary. Integrating structured warm-up and cool-down routines is also advised to prepare the joints for activity and aid in post-exercise recovery.

It is further recommended that training programs be tailored to individual characteristics such as age, body mass index, and training experience. Respondents with longer session durations and higher frequency of lower-body training reported more frequent discomfort, suggesting the need for customized routines that minimize excessive joint loading. Educational initiatives within the fitness community may be beneficial to raise awareness about the potential risks of overtraining and the importance of recovery, appropriate intensity, and balanced exercise selection. Finally, regular screening or self-monitoring of joint symptoms

using simple assessment tools may be useful in identifying early signs of knee discomfort. This can guide adjustments in training practices and help prevent the progression of symptoms.

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