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Relationship between Exercise Habits and Vegetable and Fruit Consumption with Joint Pain Complaints in the Ling Tien Kung Exercise Group

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ABSTRACT

Background: Joint pain in the elderly is chronic pain because it is persistent which can cause the elderly to be very dependent on other people, lose self-confidence, and disrupt daily activity patterns. The World Health Organization (WHO) revealed that elderly people suffering from joint disease (arthritis) in the world are in second place after cardiovascular disease, namely 14.5%. One way to prevent joint pain is to exercise regularly, one of which is by doing gymnastics and regularly consuming vegetables and fruit. This study aims to analyze the relationship between joint pain and exercise habits and vegetable and fruit consumption in the elderly in the Ling Tien Kung exercise group.

Research Methods: This research used a cross sectional approach with a sample of 26 elderly people from the Ling Tien Kung exercise group based on purposive sampling. Data were analyzed using the Chi-Square test with IBM SPSS Statistics 21 software.

Research Result: Based on the results of the analysis that has been carried out, there is no relationship between gender, age, occupation, education, smoking habits, anxiety when experiencing pain, frequency of exercise, and level of vegetable and fruit consumption with complaints of joint pain in the elderly in the Ling Tien Kung KPAD Gegerkalong exercise group ($p>0.05$).

Conclusion: The absence of a relationship between gender, age, occupation, education, smoking habits, anxiety about pain, frequency of exercise, and level of vegetable and fruit consumption with complaints of joint pain can be caused by other factors such as genes, infectious diseases, obesity, and lack of related knowledge joint disease. Maintaining a healthy lifestyle by maintaining a balanced diet and maintaining physical activity can minimize the incidence of joint pain complaints.

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1. INTRODUCTION

Elderly is person who is 60 years old or more as referred to in Undang-Undang Number 13 of 1998. The elderly is a population that experiences a continuous aging process characterized by a decrease in physical endurance. This condition makes elderly people more vulnerable to potentially fatal diseases (Hanum et al., 2018). Based on the classification established by the Kemenkes in 2020, the elderly can be classified into pre-elderly in the range of 45-59 years, elderly 60-69 years, and elderly with high risk >70 years or >60 years. In elderly people, cognitive decline is the main cause of inability to perform normal daily activities and the most common cause of dependence on others for self-care (care dependence). As age increases, the number of people with cognitive decline and dementia increases (Susanti et al., 2024).

The aging process in the elderly is characterized by a gradual decline in the ability of body tissues to repair themselves, replace damaged tissues, or maintain normal function. As a result, the body becomes less able to fight infection or repair damage that occurs. In addition to physical changes, the elderly also experience changes in psychological or intellectual aspects, which affect their thinking and emotions. The elderly also experience changes in social life, related to their role in the social environment, as well as spiritual changes or beliefs (Hanum et al., 2018). One of the changes experienced by the elderly is disorders of the cardiovascular and musculoskeletal systems. Cardiovascular disorders are known to be life-threatening, while musculoskeletal problems, such as joint pain, are often the main complaints (Astuti et al., 2020). World Health Organization (WHO) 2022 revealed that the elderly suffering from joint disease (arthritis) in the world ranks second after cardiovascular disease, namely 14.5%. Riset Kesehatan Dasar (Riskesdas) in 2018 also states that people with joint disease are included in the second rank of non-communicable diseases in Indonesia after hypertension, namely 7.3% with the largest prevalence of sufferers being the elderly. Meanwhile, West Java province itself occupies the 6th position with the highest joint disease sufferers in Indonesia with a prevalence of 8.86%. Bandung City occupies the 9th position in the city or regency with the highest joint pain sufferers in West Java, namely 9.35%. Complaints of joint pain are more common in the age range 55 to 75 years and over (Anita et al., 2022).

Joint pain in the elderly includes chronic pain because it is persistent which can cause the elderly to be very dependent on others, lose self-confidence, and disrupt daily activity patterns. The impact can also be fatal so that the elderly will find it difficult to carry out activities as usual, the joints will become stiff, it is difficult to walk, and can result in total paralysis (Handayani & Riyadi, 2022). The causes of joint pain occur due to inflammation, injury, fractures, degenerative processes, vascular supply disorders, and others (Islamiah et al., 2020).

Management of the acute phase of joint pain is aimed at minimizing the effects of inflammation and controlling pain. In addition, the doctor will provide topical treatments, such as ointments or gels that are applied to the skin on the uncomfortable joint area to help relieve pain. The next step if it requires serious action is surgery called arthroscopy and joint replacement (IRA Indonesia, 2020). In addition to seeing a doctor, exercise can help regain strength and function such as walking, swimming, or aerobic exercise. Regular exercise can help reduce pain and improve mobility and flexibility without causing joint damage. Another way is to do activities without heavy pressure, ice compresses, and also need adequate rest (Setyowati et al., 2022).

Elderly people often seek physical activity by doing light exercises. Exercises is a physical exercise that is planned to move the body as a whole systematically and harmoniously (Sartika et al., 2020). Good exercises for the elderly are exercises that focus on movement exercises that do not rely too heavily on movements such as elderly fitness exercises, ergonomic exercises, and walking (Listyasari, 2019). Ergonomic exercises is a movement exercise that relies on muscle

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movement and breathing techniques, one example of ergonomic exercises is Ling Tien Kung movement training (Palupi & Widiani, 2019).

Ling Tien Kung is a movement training technique that focuses on the health and healing of the movement center in the anus or empet-empet anus (Fu Kang) and the human battery charge (Hidayah & Kasiati 2024). The movements contained in Ling Tien Kung movement training can improve blood flow, so that the transportation of nutrients, oxygen, and metabolic products can run well and improve quality of life (Palupi et al., 2022).

Vitamins and minerals are the most important nutrients found in fruits and vegetables. Vitamins found in fruits and vegetables include provitamin A, vitamin C, vitamin K, vitamin E, and various groups of vitamin B complex. Contains potassium (K), calcium (Ca), sodium (Na), iron (Fe), magnesium (Mg), manganese (Mn), zinc (Zn), selenium (Se), boron (B) various types, including potassium (K), calcium (Ca), sodium (Na), and iron (Fe). These vitamins and minerals act as antioxidants that protect the body from oxidative damage (Rizqia & Yulianti, 2022). Fiber found in fruits and vegetables helps in maintaining digestive health. Adequate fiber intake can also help prevent cardiovascular disease and obesity (Kemenkes 2018).

In addition, food intake factors also have an important role in maintaining bone and joint health. This can be caused by the high vitamin and mineral content in vegetables and fruits. Various properties contained in vegetables and fruits that can help in providing synergistic protective effects against the pathogenesis of arthritis or joint pain include antioxidants, anti-inflammatory, and immunomodulation. Antioxidant effects can neutralize reactive oxygen species that contribute to the degradation of joint cartilage in the knee. In addition, when oxidative stress occurs, it will trigger the activation of pro-inflammatory cytokines so that immune reactions will modulate joint pain sensitization. Vegetable and fruit consumption is believed to have a more synergistic and beneficial effect in reducing knee pain (Han et al., 2017).

One type of vitamin with a relatively high antioxidant content is vitamin C. The main role of vitamin C in the body is to accelerate wound healing, maintain healthy blood vessels and bones, and maintain body tissues by increasing collagen production (Daswi, 2024). Several preclinical studies have demonstrated that consuming vitamin C supplements can accelerate bone healing following fractures, increase type I collagen synthesis, and reduce oxidative stress levels by neutralizing Reactive Oxygen Species (ROS), thereby improving tissue composition in ligaments, tendons, and bones (Insua et al., 2024).

To strengthen and prevent bone damage, consuming foods rich in calcium, vitamin K, and polyphenols is also necessary. Calcium plays a vital role in increasing bone mineral density and preventing bone fragility. Calcium can assist osteoblast activity in extracellular matrix synthesis, thereby improving bone formation (Pane et al., 2025). Meanwhile, vitamin K, particularly vitamin K1, plays a role in bone metabolism through the carboxylation of osteocalcin (a non-collagen protein), which plays a role in bone mineralization (Al-Suhaimi & Al-Jafary, 2020).

Polyphenol compounds are also antioxidants that can reduce inflammation in bone tissue by decreasing the expression of pro-inflammatory cytokines, such as interleukin 6 (IL-6) and tumor necrosis factor-alpha (TNF-α). This can increase osteoblast proliferation and even fracture healing (Amarasekara et al., 2021). However, no studies have investigated the relationship between vegetable and fruit consumption and exercise habits with overall joint pain. Therefore, this study aimed to analyze the relationship between joint pain and exercise habits and vegetable and fruit consumption among older adults in Ling Tien Kung exercise group.

2. METHODS

The method used in this study is quantitative descriptive with a cross-sectional approach because all data related to the research variables can be obtained simultaneously at one time (Abduh et al., 2023). This study was conducted on November 3-14, 2024 on the Ling Tien Kung

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exercise group in *Komplek Perumahan Angkatan Darat* (KPAD), Gegerkalong, Sukasari, Bandung City. Elderly people who were members of the Ling Tien Kung exercise group were the subjects of this study. The sampling technique used in this study was purposive sampling, involving 26 participants who met the inclusion criteria of being members of the Ling Tien Kung KPAD Gegerkalong gymnastics group and being willing to participate as research respondents.

The instruments used in this study were a 24-item Rheumatoid Arthritis Pain Scale (RAPS) and a 71-item Food Frequency Questionnaire (FFQ), which concentrate on vegetable and fruit intake. The RAPS questionnaire used was adapted into Indonesian and underwent validity and reliability tests. The results showed that all questions were valid, with a Pearson r-correlation value ranging from 0.426 to 0.864 (r>0.31) and a Cronbach alpha value of 0.760 (Chintyawati, 2014). Meanwhile, the FFQ is generally used with adult research, as Syauqy et al. (2021) indicated that the FFQ has acceptable reproducibility and validity among middle-aged and older adults in Indonesia. This instrument was administered directly to the respondents using an interview technique, aiming to collect data relevant to the study. The author obtained research permission from the head of the Ling Tien Kung gymnastics group and received a retribution letter regarding the permit for this research.

This data was processed using the Mann-Whitney method with IBM SPSS Statistics 21 software. The Mann-Whitney test was selected because the data did not satisfy the normality assumption, as indicated by the Shapiro-Wilk test ($p = 0.001$, $p < 0.05$). This non-parametric test assessed the association between joint pain complaints and variables including gender, age, occupation, education, smoking habits, anxiety during pain, exercise frequency, and fruit and vegetable consumption. Study results were interpreted based on the Asymp. Sig. (2-tailed) value, with a significance threshold of $p = 0.05$.

All independent variables in this study were divided into 2 categories (dichotomy). The gender variable consisted of female and male, the age variable consisted of elderly (> 60 years) and pre-elderly (45-59 years), the occupation variable consisted of unemployed and employed, the education variable consisted of high school graduate/equal and college graduate (both bachelor's, master's, and doctor's degrees), the smoke variable consisted of smoking and non-smoking, the anxiety during pain variable consisted of anxiety or not, the frequency of exercise variable consisted of routine and not, and the level of vegetable and fruit consumption consisted of infrequent and frequent. Grouping of the frequency of exercise and level of vegetable and fruit consumption variables had a cut-off based on the median value of each variable.

3. RESULTS AND DISCUSSION

This study consisted of 26 elderly respondents who are members of the Ling Tien Kung exercise group at KPAD Gegerkalong. The characteristics of the respondents in this study are described in Table 1 which consists of gender, age, education, occupation, frequency of exercise, smoking habits, level of vegetable and fruit consumption, joint pain complaints, and anxiety of pain experienced by the respondents.

Table 1. Respondent's Characteristics

Variable	n	%
Gender		
Female	15	57,7
Male	11	42,3
Age		
Elderly (>60 years)	20	76,9
Pre-elderly (45-59 years)	6	23,1

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Variable	n	%
Education		
High school graduate/equal	10	38,5
College graduate	16	61,5
Occupation		
Unemployed	18	69,2
Employed	8	30,8
Frequency of Exercise		
Not routine	8	30,8
Routine	18	69,2
Smoke		
Yes	1	3,8
No	25	96,2
Level of Vegetable and Fruit Consumption		
Infrequent	12	46,2
Frequent	14	53,8
Joint Pain Complaints		
Yes	14	53,8
No	12	46,2
Anxiety during Pain		
Yes	3	11,5
No	23	88,5

Table 1. shows the characteristics of the respondents where most of the respondents (57.7%) of this study were women. The age category of the respondents was dominated by the elderly over 60 years old with a total of 20 respondents (76.9%). The average highest level of education of the respondents was college graduate, totaling 16 people (61.5%), consisting of 1 Diploma 4 (D4) graduate, 9 Bachelor's degree (S1), and 6 Master's degree (S2). This shows that the educational level of the respondents is quite high. However, the majority of respondents (69.2%) are unemployed, consisting of 8 housewives, 10 retired civil servants, so that they have more flexible time to follow the exercise schedule, which is held every Thursday and Sunday. This is consistent with the data on the frequency of respondent's exercise, which states that most respondents (69.2%) are classified as routine in doing this Ling Tien Kung exercise. Almost all of the respondents (96.2%) did not have a smoking habit, and most of the respondents (53.8%) had a fairly frequent consumption of vegetables and fruits, based on the results of the scoring of the Food Frequency Questionnaire (FFQ). This shows that most of the respondents have a fairly healthy lifestyle by avoiding smoking and high consumption of vegetables and fruits. However, most respondents (53.8%) still experience joint pain and some (11.5%) feel anxious when they experience pain. These results indicate that despite maintaining physical activity and a healthy diet, complaints of joint pain continue to be a health problem that needs attention in this group.

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Table 2. Analysis Result Relation between Exercise Habits and Fruit and Vegetable Consumption with Joint Pain Complaints in The Ling Tien Kung Exercise Group

Variable	Joint Pain Complaints				Total	p-value
	Yes		No			
	F	%	f	%		
Gender						
Female	9	60	6	40	15	0,471
Male	5	45,5	6	54,5	11	
Age						
Elderly (>60 years)	11	55	9	45	20	0,833
Pre-elderly (45-59)	3	50	3	50	6	
Occupation						
Unemployed	12	66,7	6	33,3	18	0,054
Employed	2	25	6	75	8	
Education						
High school graduate/equal	5	50	5	50	10	0,760
College graduate	9	56,3	7	43,8	16	
Smoke						
Yes	0	0	1	100	1	0,280
No	14	56	11	44	25	
Anxiety during Pain						
Yes	3	100	0	0	3	0,095
No	11	47,8	12	52,2	23	
Frequency of Exercise						
Not routine	4	50	4	50	8	0,797
Routine	10	55,6	8	44,4	18	
Level of Vegetable and Fruit Consumption						
Infrequent	8	72,7	3	27,3	12	0,105
Frequent	5	35,7	9	64,3	14	

Table 2 shows that the analysis results of the relationship between gender, age, occupation, education, smoking habits, anxiety when experiencing pain, exercise habits, and consumption of vegetables and fruit with complaints of joint pain in the Ling Tien Kung exercise group show that there is no significant relationship between these factors. Based on the data obtained, all the variables had a p-value greater than 0.05, indicating that these factors did not statistically affect complaints of joint pain. Although there were differences in the proportion of joint pain complaints between the groups who exercised regularly and not regularly, and those who rarely and often consumed fruits and vegetables, these results indicated that these factors did not have a significant effect.

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3.1 Relation between Joint Pain Complaints with Gender

Women have different sex hormones than men, the hormones estrogen and progesterone can affect the immune system which can trigger joint pain, such as rheumatoid arthritis (Salmiyati & Asnindari, 2020). Women have a stronger tendency to regulate inflammatory responses than men regarding various antigens which can be translated into more inflammatory responses regarding self-antigens. If estrogen hormone levels decrease, it may act in autoimmunity such as complaints in autoimmune diseases during fluctuations in changes in hormone aspects and variability, namely menstruation and pregnancy.

Results of analysis showed that female respondents had more complaints of joint pain. A total of 9 people (60%) had complaints of joint pain, while 6 people (40%) had no complaints of joint pain. For male respondents, only 5 people (45,5%) had complaints of joint pain, while 6 people (54,5%) did not have it. The analysis test results show a p-value = 0.471 (p>0.05), meaning there is no significant relationship between gender and complaints of joint pain. This is influenced by the small number of respondents and the presence of several cofounding variables, such as body mass index, dietary quality, and comorbid diseases, which are limitations of this study.

3.2 Relation between Joint Pain Complaints with Age

As we age, the human body experiences a decline in physiological functions, including muscle strength, joint disorders, and capacity for physical activity. Elderly people who are not physically active are at higher risk of experiencing degenerative diseases, including joint pain, which can affect their quality of life. Decreased muscle mass (sarcopenia), bone loss (osteoporosis), and decreased synovial fluid function are the main causes of this disorder. Regular physical activity appropriate to your abilities, such as walking or light exercise, can help maintain muscle strength, maintain joint mobility, and prevent stiffness. Elderly who remain physically active also tend to have milder complaints of joint pain compared to those who are inactive (Purbasari & Soesanto, 2022). Research shows that age is not the only factor that influences joint pain complaints. Based on the analysis in the Table 2, although the elderly (>60 years) have a slightly higher prevalence of joint pain complaints compared to the pre-elderly (45- 59 years), the p-value is 0,833 (p>0,05) indicating there is no relationship statistically significant between age and complaints of joint pain.

Other research however shows different results, Made's (2017) research found that there is a relationship between age and osteoarthritis in elderly women with a p-value 0f 0,028. In addition, the Odd Ratio (OR) value of 3,375 indicates that elderly people aged 70-80 years are 3,4 times more likely to experience severe osteoarthritis compared to elderly people aged 45-69 years. Another study by Gunadi (2022) also showed a significant relationship. The correlation value of -0,479 indicates a negative correlation with moderate strength. This negative correlation indicates that the higher a respondents level of physical activity, the lower the level of pain they feel. This emphasizes the importance of physical activity in reducing the degree of pain in respondents.

3.3 Relation between Joint Pain Complaints with Occupation

Work is often linked to a person's risk of disease. Complaints of joint pain sometimes arise when doing activities of work that is quite heavy, this often interferes with a person's activities. Heavy and not ergonomic work can influence complaints of joint pain, including carrying heavy loads, repetitive movements, using equipment that is not in accordance with procedures and heavy and dangerous work positions (Auliya & Lantika, 2021).

The results of the analysis showed that 12 people (66,7%) who were not working had complaints about joint pain and 6 people (75%) who were still working had no complaints about joint pain. Statistical test calculations showed that p=0,054 (p>0,05) means that there is no

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significant relationship between complaints of joint pain and a respondent's job. This is in line with research by Auliya & Lantika in 2021 that cleaners did not have complaints of joint pain as a result of their work. Complaints of joint pain resulting from work have several other factors that can trigger the pain. Some jobs that do not require lifting weights are less likely to trigger pain in a person's joints (Indriyani, et al., 2022).

3.4 Relation between Joint Pain Complaints with Education

Education level is one of the factors that can subjectively influence a person's quality of life. The quality of life will increase along with the higher level of education obtained by individuals. This is because of the positive influence of education on quality of life. So the higher a respondent's level of education, the more likely they will have better knowledge about health, including joint pain.

The results of the analysis showed that among elderly who graduated from high school/equivalent, 5 elderly (50%) experienced complaints of joint pain, while 5 other elderly (50%) did not experience joint pain. Then for elderly who graduated from college, 9 elderly (56,3%) experienced complaints of joint pain, while 7 elderly (43,8%) did not experience complaints of joint pain. From the results of statistical test calculations, the result was p=0,760 (p>0,05), which means there is no relationship between education level and complaints of joint pain.

The educational factor greatly influences knowledge about disease, because sufficient education will make it easier to identify stressors and influence awareness and understanding of stimuli (Andesty & Syahrul, 2018). But research by Ummayah & Warsito (2016) shows that the majority of those who have taken further education do not comply with treatment procedures.

3.5 Relation between Joint Pain Complaints with Smoking Habits

Smoking habits are a factor that is often found in various health problems. The content in cigarettes is nicotine. Nicotine is a compound that can cause blood flow to narrow and make it difficult for blood to flow (Lathifah et al,. 2020). Carbon monoxide compounds can also bind hemoglobin in the blood so that the circulation of oxygen in the blood can be hampered (Ramadhan et al., 2022).

The results of the analysis showed that there were 1 (100%) people who smoked and had no complaints of pain in their joints. Meanwhile, 14 (56%) people who did not have smoking habits tended to complain of joint pain. The results of the analysis test show that the resulting p-value is 0,280, which means there is no significant relationship, so the smoking habit of the elderly has no influence on the joint pain complaints experienced by respondents. However, research findings on this issue are still highly variable. One cohort study of individuals at risk for osteoarthritis demonstrated no significant association between smokings and the prevalence, incidence, or progression of radiographic hip osteoarthritis and symptomatic hip osteoarthritis, either at baseline or over a 4 to 5-year follow-up period. Even though smoking plays an indirect role in the development of joint pain, this may be due to changes in body mass index, metabolism, and appetite suppression, which can be indirect factors in the development of joint pain (Salis, 2024).

3.6 Relation between Joint Pain Complaints with Anxiety during Pain

Each individual has unique characteristics when responding to pain including anger, fear, anxiety, depression and fatigue. This may influence the pain felt by each individual (Nuridayanti et al., 2021). In this study only 3 out of 14 people who complained of joint pain felt anxious when the joint pain appeared. Statistical test calculations resulted in p=0,095 (p>0,05), meaning that there was no significant relationship between the condition of anxiety when experiencing pain

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and complaints of joint pain in the elderly in the Ling Tien Kung exercise group. However, this research is not in line with research by Putra et al (2018) which proves that based on data analysis using the Spearman correlation test, the result was p-0,00 (p<0,05), which means that there is a relationship between the intensity of osteoarthritis pain and the level of pain. Anxiety in the elderly at the Puskesmas Dinoyo Malang with a calculated r value of 0,728, which means the level of variable relationship is classified into the strong level category. This is supported by research by Nuridayanti et al (2021) which proves that there is a relationship between joint pain and the level of anxiety of gout sufferers in Sumengko Village, Sukomoro District, Nganjuk Regency, as proven by the results of the Spearman correlation test analysis which showed p=0,003 (p<0,05) with a correlation coefficient value of 0,495 which shows a positive correlation with moderate strength. This means that the lighter the pain, the lighter the level of anxiety faced by the sufferer.

Joint pain is a consequence of the body due to calcification or other accompanying diseases (high levels of uric acid or cholesterol). Anxiety is a response to certain threatening situations. Anxiety is a normal thing that occurs during development, as well as physiological and biological changes. This is because when joint pain occurs, the sufferer will not be able to move freely and will even creep around, which is followed by severe pain that can lead to crying, difficulty sleeping, and feeling pain throughout the body (Astuti, 2020).

Anxiety levels can be influenced by age, gender, economic status, other background characteristics, and social support. In this study all respondents who experienced anxiety when experiencing joint pain were female. This is in line with Stuar's (1998) statement: in Astuti (2020), where anxiety is more often seen in women because women often use their conscience, giving rise to excessive feelings of anxiety due to illness or psychology. Meanwhile, men use their instincts more often so feelings of anxiety rarely appear compared to women.

3.7 Relation between Joint Pain Complaints with Frequency of Exercise

In general, joint exercise movements are intended to improve movement ability, function, muscle strength and endurance, aerobic capacity, balance joint biomedicine and a sense of joint position. This exercise concentrates on joint movement while stretching the muscles and strengthening them, because these muscles help the joints to support the body (Caturini et al., 2023). Elderly exercise increases blood circulation and blood volume and triggers an increase in the balance between osteoblasts and osteoclasts in bone tissue. If exercise is not done regularly it will reduce the formation of osteoblasts so that bone formation slows down and can result in a decrease in bone mass or bone loss. Elderly exercise done regularly can keep bones and joints strong.

The results of the analysis showed that respondents who did not regularly do exercise showed balanced results, namely 4 respondents (50%) had complaints of joint pain. Of the respondents who regularly did exercise, there were 10 respondent (55,6%) who had complaints of joint pain, while 8 respondent (44,4%) had no complaints of joint pain. The result of the analysis test shows that the p-value = 0,797 (p>0,05) means that there is no significant relationship between the frequency of exercise and complaints of joint pain.

3.8 Relation between Joint Pain Complaints with Level of Vegetable and Fruit Consumption

The results of the analysis that have been carried out prove that there is no relationship between exercise habits and the level of vegetable and fruit consumption and complaints of joint pain in the elderly in the Ling Tien Kung exercise group which is characterized by a value of p=0,105 (p>0,05). This can be caused because joint pain is a multifactorial disease that can be caused by various factors so that it may be influenced by other factors. Other factors that influence the risk of developing joint pain include genetics, infectious diseases, obesity, and the level of knowledge regarding joint pain. Knowledge has a significant contribution to recurrent

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pain in elderly people with rheumatoid arthritis, where the better a person's knowledge the better a person will be managing factors that trigger recurrent pain (Murtiningsih et al., 2021).

Excessive weight gain can cause the knee joints to work harder to support the body, which can affect the durability of the cartilage. As a result, the cartilage will be damaged and cause fractures in the collagen tissue and degradation of proteoglycans (Hartutik, 2018). Factors such as obesity, excess body weight, and tissue degeneration have a greater contribution to joint pain than age. Tissue degeneration, especially in cartilage and synovial fluid, is often found in the elderly and is closely related to increased pain. Therefore, regular physical activity remains an important step to prevent decline in joint function and improve the quality of life of the elderly.

Overall, the results of the analysis that have been carried out prove that there is no relationship between exercise habits and the level of vegetable and fruit consumption and complaints of joint pain in the elderly in the Ling Tien Kung exercise group, which is characterized by a p-value> 0,05. This can be caused because joint pain is a multifactorial disease that can be caused by various factors so that it may be influenced by other factors. Other factors that influence the risk of developing joint pain include genetics, infectious diseases, obesity, and the level of knowledge regarding joint pain. Knowledge has a significant contribution to recurrent pain in elderly people with rheumatoid arthritis, where the better a person's knowledge, the better a person will be in managing factors that trigger recurrent pain (Murtiningsih et al., 2021).

The advantages of this research have explained the factors studied such as gender, age, occupation, education, smoke, anxiety during pain, frequency of exercise, level of fruit and vegetable consumption. This research has combined theoretical and practical aspects to provide comprehensive insight, namely conducting direct interviews to the elderly in the Ling Tien Kung Exercise Group and also got information from previous journals. Last, the results shown are relevant and proven. This research also focused on Ling Tien Kung, an elderly exercise group that focuses on joint health. Because it's not active movements, but focuses on movements that involve joints such as standing on tiptoe. So the subject is very much in line with the type of research.

The weakness of this research is that the sample studied does not adequately represent all members of Ling Tien Kung exercise group because the time used for this research tends to be short. Apart from that, there is also no control group that can be compared with the research sample. The research sample was elderly, which caused many of them to have difficulty to be interviewed and were confused when being asked about questions on the questionnaire and reducing the validity of the answers. In addition, some variables limit the author's ability to address certain aspects of this study, including body mass index, dietary quality, dietary history, medication use, and comorbidities, which could be confounding variables that influence the study's results.

4. CONCLUSION

Based on the results of the research, it can be concluded that there is no significant relationship between gender, age, education, occupation, smoking habits, anxiety in pain, frequency of exercise, and level of vegetable and fruit consumption with complaints of joint pain in the elderly in the Ling Tien Kung KPAD Gegerkalong exercise group. The lack of relationship between variables in this study may be caused by the number of respondents, which is a limitation of the researcher, so the results of the study are not in line with several previous studies. In addition, joint disease is a multifactorial disease, so it can be influenced by various other factors such as obesity, genetics, and even the level of knowledge. Therefore, it is important to regulate a healthy lifestyle by doing physical activity and regulating a balanced diet so that it can reduce the risk of joint pain complaints. For further research, it is recommended to carry out biochemical examinations of the respondents as additional variables to establish the

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diagnosis of the joint pain complaints suffered by the respondents and also to carry out research on a control group that does not do regular exercise as a comparison.

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