P-ISSN: 3025-6518
E-ISSN: 3025-0501

Almakki Health Informatics Journal

COMMUNITY SERVICE TO INCREASE PATIENT AWARENESS IN OSTEOARTHRITIS DISEASE PREVENTION AT IBNU SINA HOSPITAL, PANAKUKANG DISTRICT MAKASSAR

Andi Dhedie Prasatia Sam[1], Fadil Mula Putra[2]
Universitas Muslim Indonesia, Sulawesi Utara, Indonesia
E-mail: andidhedie@gmail.com[1], lesdoup2@gmail.com[2]

KEYWORDS

Osteoarthritis, Prevention, Knowledge.

ABSTRACT

This study aimed to investigate the relationship between Presbycusis, Elderly, Osteoarthritis Audiometry, and risk factors such as obesity, lack of physical activity, and injury to the joints. The research method used was a survey using questionnaires distributed to the elderly at Ibnu Sina Hospital, Panakkang District, Makassar. The results showed a significant correlation between the conditions of presbycusis, osteoarthritis, and the mentioned risk factors. The implication of this research is the importance of increasing public awareness and knowledge of osteoarthritis prevention and management through targeted and interactive education, such as using banners that are easy to understand and involve direct discussions with the community. This is expected to reduce the incidence of osteoarthritis and reduce the burden of medical costs and improve the quality of life of the elderly.

INTRODUCTION

Panakkukang Sub-district is one of the sub-districts in Makassar City that does not have a beach. The average land elevation is 500 meters above sea level. The area of Kecamatan Panakkukang is 17.05 km2, which is divided into eleven sub-districts. The two kelurahan with the most significant areas are Kelurahan Pampang (2.63 km2) and Kelurahan Panaikang (2.35 km2). The kelurahan with the smallest area in Kecamatan Panakkukang is Kelurahan Sinrijala, with an area of only 0.17 km2. The distance of each kelurahan in Kecamatan Panakkukang to the sub-district capital ranges from 1-2 km (Contributors, 2023).

In 1977, the Panakkukang Sub-district was categorized as a peri-urban area in Makassar City. This classification is based on the distance of Kecamatan Panakkukang from the centre of Makassar City government. Panakkukang sub-district is bordered to the north by Tallo sub-district. Then, to the east, the Panakkukang Sub-district is bordered by the Tamalanrea Sub-district. Panakkukang sub-district borders Makassar sub-district to the west and Rappocini sub-district to the south (Contributors, 2023).

In 2000, the population of Kecamatan Panakkukang was 123,820. In 2004, the population of Kecamatan Mariso was 129,240. The population growth rate for the period 2000-2004 was 1.08%. Then, in 2005, the population in Kecamatan Panakkukang increased by 0.56% to 129,967 people (Contributors, 2023).

Panakkukang sub-district experienced a population growth of 3.27% in the 2015-2016 period. In 2015, the total population of Kecamatan Panakkukang was 142,308 people. Then,

in 2016, it increased to 147,783 people. In 2016, the sex ratio of males to females in Kecamatan Panakkukang was 0.98. The male population was 73,114, and the female population was 74,669 (Contributors, 2023).

In 2000, there were 30,112 households in Kecamatan Panakkukang. Each household in Kecamatan Panakkukang in 2000 had an average of 4.15 family members. Then, in 2004, the number of households in Kecamatan Panakkukang was 28,404, and in 2005, it was 24,277. The average household size in 2004 was 4.55 and increased to 4.90 in 2005 (Contributors, 2023).

In Indonesia alone, according to the Indonesian Ministry of Health, there are 55 million people (24.7%) suffering from osteoarthritis with grouping based on age; the majority of sufferers are over 75 years old at 54.8%. This was followed by the 65-74 year old group at 51.9% and the 55-64 year old group at 45%. In a study conducted at Dr Wahidin Sudirohusodo Hospital Makassar in 2016, 483 osteoarthritis patients were found, and 48 patients received medical rehabilitation treatment. The high incidence of osteoarthritis both globally and locally and the latest valid data on the incidence rate and typical characteristics of osteoarthritis patients in the outpatient unit at Ibn Sina Hospital Makassar cause the urgent need for research on how the characteristics of osteoarthritis patients with the hope that this research can be a reference for future research (Hidayati et al., 2023).

In the data listed in the registration book, there were 3,684 patients in the outpatient unit registered in January 2018-December 2021 in the internal medicine poly and orthopedic surgery poly. Of the 3,684 patients in the outpatient unit registered in that period, 124 patients were diagnosed with osteoarthritis by doctors. This number indicates that the occurrence of osteoarthritis is high. This is directly proportional to the statement that osteoarthritis is the most common inflammatory joint disease in the world compared to other types of arthritis. The total sample in this study was 124 samples whose characteristics could be studied (Hidayati et al., 2023).

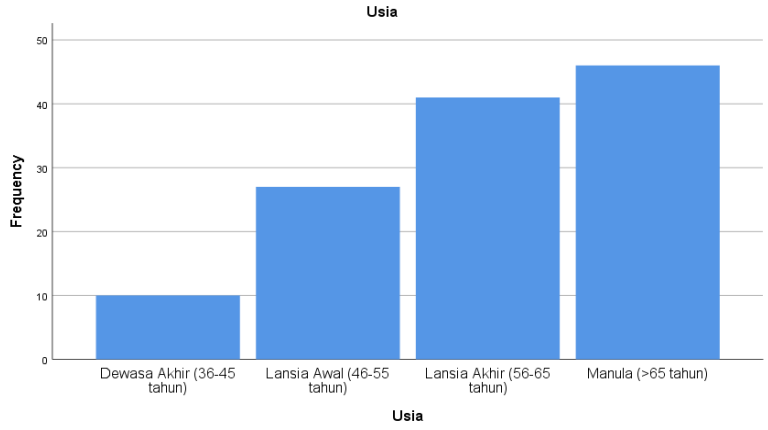

Figure 1: Distribution of Osteoarthritis Patients by Age

Based on Figure 1. it can be seen that of the 124 samples/osteoarthritis patients diagnosed by doctors, based on age, the highest proportion is in the elderly age group (> 65 years), namely 46 patients (37.1%), then followed by the late elderly group (56-65 years), namely 41 patients (33.1%), then the early elderly group (46-55 years), namely 27 patients (21.8%), and the most

minor proportion in the late adult group (36-45 years), namely ten patients (8.1%). (Hidayati et al., 2023).

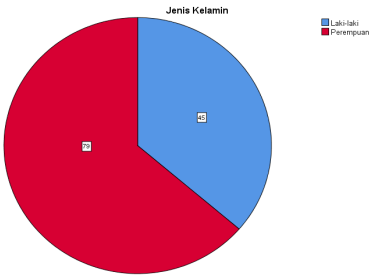

Figure 2. Distribution of Osteoarthritis Patients Based on Gender

Based on Figure 2. it can be seen that out of 124 samples/osteoarthritis patients diagnosed by doctors, based on gender, the highest proportion is in female patients, namely 79 patients (63.7%), while in male patients, namely 45 patients (36.3%). (Hidayati et al., 2023).

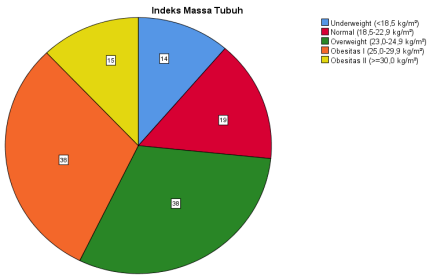

Figure 3. Distribution of Osteoarthritis Patients Based on BMI

Based on Figure 3, it can be seen that out of 124 samples/osteoarthritis patients diagnosed by doctors, based on BMI, the highest proportion is in the group of patients with overweight and obesity I nutritional status, namely 38 patients (30.6%) each, then followed by a group of patients with normal nutritional status, namely 19 patients (15.3%), then a group of patients with obesity II nutritional status, namely 15 patients (12.1%), and the minor proportion in the group of patients with underweight nutritional status, namely 14 patients (11.3%). (Hidayati et al., 2023).

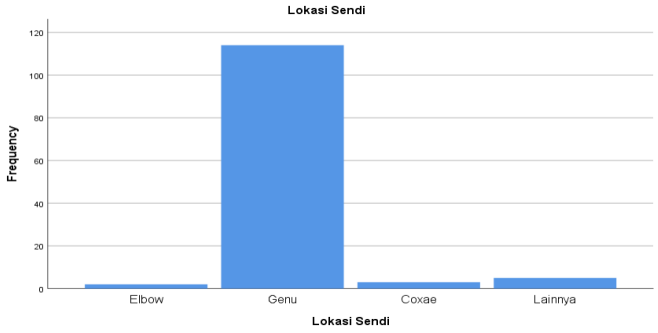

Figure 4. Distribution of Osteoarthritis Patients Based on Joint Location

Based on Figure 4. it can be seen that of the 124 samples/osteoarthritis patients diagnosed by the doctor, based on the location of the joint, the highest proportion was 114 patients (91.9%), followed by other locations, namely five patients (4%), then located in the coxae, namely three patients (2.4%), and the minor proportion was located in the elbow, namely two patients (1.6%). (Hidayati et al., 2023).

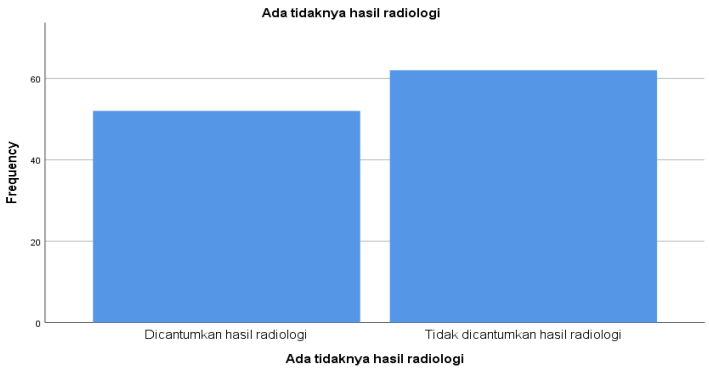

Figure 5: Distribution of Osteoarthritis Patients Based on the Absence of Radiology Results

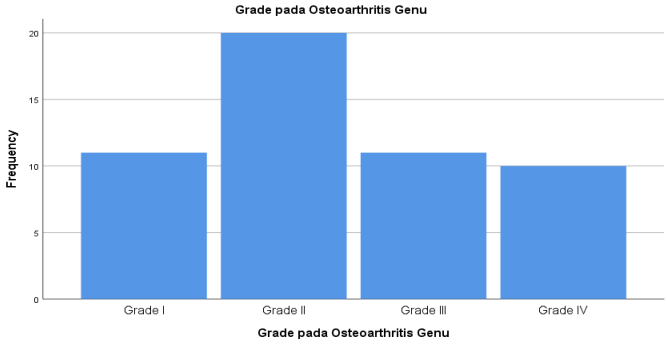

Figure 6: Distribution of Osteoarthritis Patients by Grade

Based on Figure 5. Figure 6. It can be seen that out of 114 samples/patients with genu osteoarthritis diagnosed by doctors, only 52 patients have information on the grade of genu osteoarthritis; the highest proportion is in patients with grade II conventional radiographic results, namely 20 patients (16.1%), then followed by patients with grade I and grade III conventional radiographic results, namely 11 patients (8.9%) each. The most minor proportion is in patients with grade IV conventional radiographic results, namely ten patients (8.1%), and as many as 62 patients (58.1%) did not include radiology results. (Hidayati et al., 2023)..

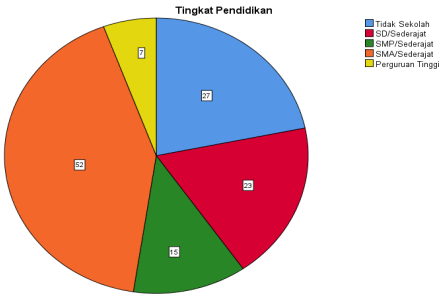

Figure 7. Distribution of Osteoarthritis Patients Based on Education Level

Based on Figure 7, it can be seen that of the 124 samples/osteoarthritis patients diagnosed by doctors, based on the level of education, the highest proportion was in patients with high school / equivalent education, namely 52 patients (41.9%), followed by patients who did not go to school, namely 27 patients (21.8%), then patients with elementary/equivalent education, namely 23 patients (18.5%), then patients with junior high/equivalent education, namely 15

patients (12.1%) and the minor proportion was patients with college education, seven patients (5.6%). (Hidayati et al., 2023).

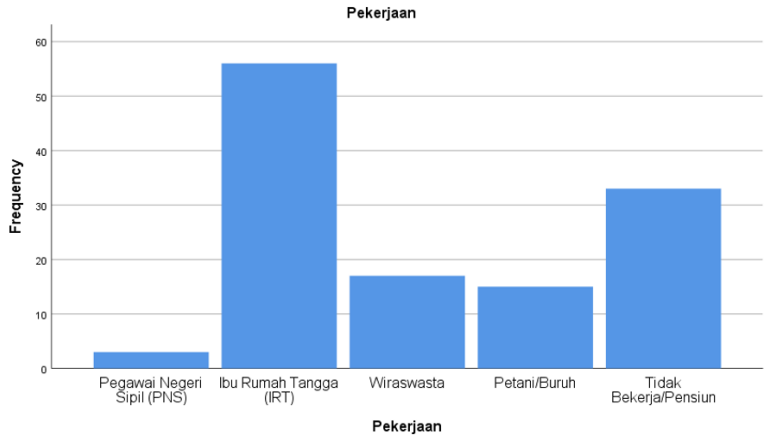

Figure 8: Distribution of Osteoarthritis Patients Based on Occupation

Based on Figure 8, it can be seen that out of 124 samples/osteoarthritis patients diagnosed by doctors, based on occupation, the highest proportion is in patients with jobs as housewives (homemakers), namely 56 patients (45.2%), followed by patients who do not work / pension, namely 33 patients (26.6%), then patients with jobs as self-employed, namely 17 patients (13.7%), then patients with jobs as farmers/labourers, namely 15 patients (12.1%) and the minor proportion of patients with jobs as civil servants, namely three patients (2.4%). (Hidayati et al., 2023).

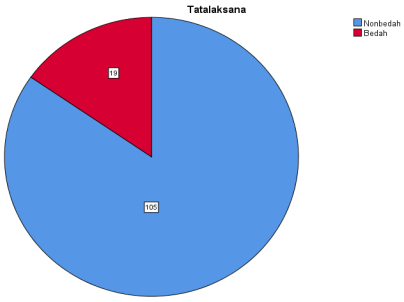

Figure 9: Distribution of Osteoarthritis Patients Based on Management

Based on Figure 9, it can be seen that of the 124 samples/patients with osteoarthritis diagnosed by doctors, based on the treatment received, the highest proportion was in patients with non-surgical management, namely 105 patients (84.7%), while in patients with surgical management, there were 19 patients (15.3%). (Hidayati et al., 2023).

RESEARCH METHOD

The implementation method applied in the implementation of this PKM (*Pengabdian pada Masyarakat*, Community Service) activity program is the provision of science and technology counselling to community groups who are visitors to Ibnu Sina Hospital in Panakukang District. The method used in training is the participatory training method, which involves as much as possible the participation of partners in lectures and discussions.

Table 1. Type of Activity

No.	Activity Type	2023-2024 Month				Place
		11	12	1	2	
1	Licensing Preparation					Menara UMI lt.3
2	Program socialization					Ibn Sina Hospital
3	Socialization of Increasing Patient Awareness in the Prevention of Osteoarthritis Disease at Ibnu Sina Hospital, Panakukang District Makassar					Ibn Sina Hospital
4	Activity evaluation					Sanrobone Village
5	Report writing					Menara UMI lt.3

The successful implementation of PKM (*Pengabdian pada Masyarakat*, Community Service) requires partner participation in this activity so that the partner's priority problems can be adequately resolved. The participation of partners in this activity includes:

a. Partners' openness in providing the required information related to solving partners' priority problems
b. The willingness of the partner to provide a place for the activity to be carried out in accordance with the program made by the proposing team and approved by the partner.
c. Play an active role in every activity carried out
d. Take part in the implementation of evaluation and monitoring activities

Evaluation activities will be carried out twice. The evaluated aspects include responses and concrete actions in the form of mastery of knowledge and technology (theory and practice), which are formulated in two success criteria, namely based on the output and outcome of the PKM (*Pengabdian pada Masyarakat*, Community Service) implementation. Phase 1 evaluation is carried out in an effort to measure and obtain (quantitative) data on the level of mastery (primary) of all activities that will be implemented to partners. Phase 2 evaluation is carried out after the entire series of mentoring activities so that if it has not reached the level of success, it is necessary to improve or complete things that are considered to be factors causing the failure or lack of success.

RESULT AND DISCUSSION

Osteoarthritis is the most common inflammatory joint condition worldwide, with a condition of cartilage depletion followed by inflammation in the joint and changes in bone shape. (Ambriz Murillo et al., 2015).. It is the leading cause of disability in the world, affecting 37% of people over the age of 60 and affecting 1 in 3 people over the age of 65. This prevalence increases with the presence of Osteoarthritis risk factors, such as obesity, physical inactivity, and injury to the joints. Most patients with Osteoarthritis (59-87%) have at least one other

chronic disease, especially cardiac-metabolic conditions, which will undoubtedly limit the ability to exercise and exercise, which further worsens the prognosis later. In the United States alone, it is estimated that it costs about 180 billion dollars to treat arthritis, whereas, in 2010, the arrival of patients as much as 10% of patients who can still walk were diagnosed patients with arthritis and rheumatism. This will increase to 303 billion dollars by 2018. (Abramoff & Caldera, 2020); (Goff et al., 2021); (Hansson et al., 2010); (Hawker, 2019); (Hunter et al., 2020); (Sacitharan, 2019); (Samvelyan et al., 2021); (Sharma, 2021).

Osteoarthritis is broadly divided into two major parts, namely Primary Osteoarthritis, where this condition is without a previous cause and Secondary Osteoarthritis, with a cause in the form of a previous condition, such as trauma, obesity or other diseases. (Abramoff & Caldera, 2020).

The known risk factors for Osteoarthritis are (Abramoff & Caldera, 2020); (Grässel & Muschter, 2020):

a. Age: Although the prevalence varies, it can still be concluded that age is one of the most significant risk factors in the occurrence of Osteoarthritis, where the onset of radiological abnormalities and symptoms of Osteoarthritis increases in line with the course of human life,
b. Genetically, there are 80 genes implicated in the pathogenesis of naturally occurring osteoarthritis.
c. Obesity is also an influential risk factor in Osteoarthritis; in a meta-analysis obtained, the ratio of patients with Osteoarthritis in obese patients compared to average weight is 2.96.
d. Endocrine problems, where Dyslipidemia and Type 2 Diabetes are also risk factors in Osteoarthritis without Obesity.
e. Gender-wise, women are more likely to develop symptomatic knee problems than men, with women being 1.52 times more at risk than men. However, men under the age of 50 are more likely to develop Osteoarthritis.
f. Previous injuries can be the cause of events that lead to joint damage, including fractures, cartilage damage, or meniscus injuries.
g. Occupation, where there is evidence to suggest excessive amounts of kneeling, squatting, jumping, bending and lifting, can be a trigger for Osteoarthritis of the knee.
h. Sports cartilage damage can also occur in athletes and younger individuals through the breakdown of cartilage tissue due to repeated impaction and loading.
i. Ethnicity: There is some evidence to suggest a relationship between the occurrence of Osteoarthritis in certain ethnicities in different populations, where Osteoarthritis is more prevalent in Europeans compared to Asians, Africans, and Jamaicans.
j. Joint shape and joint growth abnormalities. Congenital joint abnormalities such as *Acetabular Dysplasia, Slipped Femoral Epiphysis, Hallux Valgus* and *Valgus/Varus* joint alignment are likely to play a role in the formation and progression of Osteoarthritis.

Osteoarthritis will be complained of as a condition of complaints in one and eventually more than one joint in the form of pain, stiffness, reduced mobility, changes in joint shape and often depression. This pain is divided into two forms in the form of mild pain that persists and severe pain that occurs. Over time, this pain becomes less predictable and more persistent, with daily activities starting to suffer. In more advanced stages, the pain becomes dull and persistent, followed by intense, severe pain, leading to avoidance of certain activities. These joints with chronic pain radiologically show a narrowing of the joint gap, indicating reduced cartilage, cyst and osteophyte formation in the bone, and sclerosis of the subchondral region. It typically affects the hip, knee, hand, foot and spinal joints. It should be emphasized that the presence of damage to structures that are visible on support and the degree of pain are not always related to the symptoms of Osteoarthritis. Some individuals with severe pain have no problems with radiology, and vice versa (Abramoff & Caldera, 2020); (Fernandes et al., 2010); (Hawker, 2019); (Sacitharan, 2019).

Osteoarthritis is primarily diagnosed using clinical criteria and symptoms according to the recommendations of the *American Rheumatism Association*, where plain photographs can be used to help confirm the diagnosis using radiologic criteria such as *Kellgren-Lawrence*, which uses radiologic characteristics that show narrowing of the joint gap, osteophyte formation, subchondral sclerosis, and cysts (Abramoff & Caldera, 2020); (Sacitharan, 2019); (Samvelyan et al., 2021).

Osteoarthritis is treated with a wide variety of primary techniques, with the main focus on reducing pain reducing disability with quality of life without medication; this can include education, physical activity, which includes exercise (strengthening, aerobic, or neuromuscular exercise, or mind and body exercises such as tai chi), and weight management. In recent decades, there has been a paradigm shift from pharmacologic therapy to non-pharmacologic therapy, with exercise being a significant component in short- and long-term pain relief. Several clinical trials in patients with Osteoarthritis of the knee have concluded that physical therapy can provide short and long-term pain relief, improve joint function, and reduce the need for pain medication. In a typical clinical session, the therapist will intervene, performing manual techniques immediately before the strengthening exercises to prepare the patient for pain relief, even to the point of no pain. Motivation and personal management skills, which can be done face-to-face, including patient education, goal-setting and discipline, also give patients a sense of power over their disease state, making habitual interventions a solution to improve their ability to manage pain, fear, stress, depression, anxiety, body shape, weight and joint protection and as a patient self-monitor. The media used can vary from daily reminders, manuals and handbooks to videos. Techniques in providing education can also include counselling, role-playing, problem-solving, making agreements and providing achievement targets

(Abramoff & Caldera, 2020); (Deyle et al., 2020); (Goff et al., 2021); (Hansson et al., 2010); (Hawker, 2019) (Messier et al., 2004); (Sharma, 2021); (Sinatti et al., 2022).

Patient education programs are commonly defined as planned learning experiences that influence patients' knowledge and habits, as well as physician-supervised education. The physician can provide this education as part of the consultation, but it can also be provided by a multidisciplinary team (Fernandes et al., 2010); (Hansson et al., 2010); (Sinatti et al., 2022).

Physical inactivity, as a result of inadequate management of Osteoarthritis, further increases the risk of incidence and worsening of metabolic heart disease. Public health strategies for Osteoarthritis risk factors such as obesity, physical inactivity and knee injury, coupled with interventions for effective treatment at diagnosis, have the potential to substantially improve the quality of life and health in people with and without Osteoarthritis risk and reduce the global burden of Osteoarthritis in the community (Abramoff & Caldera, 2020); (Hawker, 2019); (Hunter et al., 2020).

Although further research is needed, the use of a brace may be effective in the management of osteoarthritis. Using a brace on the knee can reduce the symptoms of knee osteoarthritis (Abramoff & Caldera, 2020).

College Eligibility

Eligibility of Universitas Muslim Indonesia

To carry out research and community service activities, Universitas Muslim Indonesia (UMI) established the Institute for Research and Resource Development (LP2S) and the Institute for Community Service (LPkM). LPkM facilitates and supports community service and coaching activities involving lecturers or students for the community. Based on the source of funding and cooperation, community service and coaching activities carried out by LPkM are divided into three groups. The first group is the group that gets funds from the UMI Waqf Foundation, and the second group is the group whose source of funds comes from the Regional Government, BUMN, and private companies. In contrast, the third group gets funds from DITLITABMAS DIKTI KEMENDIKNAS. The performance of the LPMD Unit can be seen from the service activities proposed by lecturers funded through these three groups.

In the field of community service, UMI, through LPkM, has a pretty good track record, with both community service funded by DIKTI and cooperation and those funded by the institution. In 2015, Dikti funded eight community service activities from UMI consisting of seven IbM titles and one IbW title. A year earlier, Dikti funded 11 service activities consisting of two IbW titles and nine IbM titles.

Table 2. Eligibility of Implementation Team

No.	Implementation Team	Position	Areas of Expertise	Duties in IbM Activities
1.	dr. Andi Dhedie Prasatia Sam M.Kes SpOT (K) FICS	Chair	Orthopedics and Traumatology	Making a Proposal Activity licensing director Moderator and facilitator at activities Make a final activity report
2.	dr. Fadil Mula Putra M.Biomed SpOT	Member	Orthopedics and Traumatology	Making a Proposal Activity licensing director Moderator and facilitator at activities Make a final activity report
3.	Student	-	-	Activity Preparation Facilitator at the training session

Activity Realization

Table 3. Composition of the Implementation Team

No.	Implementation Team	Position	Areas of Expertise	Duties in IbM Activities
1.	dr. Andi Dhedie Prasatia Sam M.Kes SpOT (K) FICS	Chair	Orthopedics and Traumatology	Making a Proposal Activity licensing director Moderator and facilitator at activities Make a final activity report
2.	dr. Fadil Mula Putra M.Biomed SpOT	Member	Orthopedics and Traumatology	Making a Proposal Activity licensing director Moderator and facilitator at activities Make a final activity report
3.	Student	-	-	Activity Preparation Facilitator at the training session

Table 4. Activity Form, Time and Place

No.	Activity Type	2023-2024 Month- 11	12	1	2	Place
1	Licensing Preparation					Menara UMI lt.3
2	Program socialization					Ibn Sina Hospital
3	Socialization of Increasing Patient Awareness in the Prevention of Osteoarthritis Disease at Ibnu Sina Hospital, Panakukang District Makassar					Ibn Sina Hospital
4	Activity evaluation					Sanrobone Village

5	Report writing		Menara UMI lt.3

Target Community Participants

The participants were all people (patients, patients' families, employees, and students) who came to the Orthopedic Polyclinic of Ibnu Sina Hospital, totalling 30 people.

Table 5. Overview of Results Achieved

No.	Name	Number correct Pre Test	Number correct Post-test	Value Pre Test	Post Test Score	Changes
1	Hj Salma	2	4	40	80	100,00%
2	Ahmad Muhaimin	1	4	20	80	300,00%
3	Siti Rahmatiah	3	4	60	80	33,33%
4	Hasminah	1	5	20	100	400,00%
5	Haslita	1	5	20	100	400,00%
6	Alpian	2	5	40	100	150,00%
7	Dg. Tino	2	5	40	100	150,00%
8	Nur Azizah	1	5	20	100	400,00%
9	Nur Fadhia	1	4	20	80	300,00%
10	Finanda	2	5	40	100	150,00%
11	Nur Indah Sari	4	5	80	100	25,00%
12	Jalil OB	3	4	60	80	33,33%
13	Ainun	4	5	80	100	25,00%
14	Kamaria	5	5	100	100	0,00%
15	Nurliah	4	4	80	80	0,00%
16	Nasar	3	5	60	100	66,67%
17	His Majesty	5	5	100	100	0,00%
18	Isnawati Meilo	2	5	40	100	150,00%
19	Winda Nuri Izzah	4	5	80	100	25,00%
20	Mufardi	1	3	20	60	200,00%
21	Putri Faradilla Tadam	4	4	80	80	0,00%
22	H. Mahmud	2	4	40	80	100,00%
23	Rumawati	3	3	60	60	0,00%
24	Nurla Hikmah Sultan	3	4	60	80	33,33%
25	Yunita Asyari Dewi	2	5	40	100	150,00%
26	Nur Awaliah Putri Sari	3	5	60	100	66,67%
27	Princess M	4	5	80	100	25,00%
28	Khairun Nisa	4	5	80	100	25,00%

No.	Name	Number correct Pre Test	Number correct Post-test	Value Pre Test	Post Test Score	Changes
29	Olivia Cantika	1		20	100	400,00%
30	Elvira Samara	3	3	60	60	0,00%
Average Knowledge Change						123,61%

Activity Evaluation

This activity resulted in outcomes in the form of increased understanding from partners on the condition of Osteoarthritis disease, where there was an average increase in understanding of 123.61%. There was a maximum increase in understanding of 400% or four times in 4 participants and no increase in understanding (0%) in 6 participants.

Problems and Obstacles

There was an average increase in understanding of 123.61%. There was a maximum increase in understanding of 400% or four times in 4 participants and no increase in understanding (0%) in 6 participants. The suggestion is to prepare a qualified room with a better audio-visual system in the following organization.

CONCLUSION

The conclusion of this study is that the prevalence of presbycusis in Tangerang City Hospital during the period 2014 to October 2023 is quite low, however, this remains a concern because of its impact on the quality of life of the elderly who experience hearing loss. Furthermore, the majority of presbycusis patients are men who use BPJS as collateral, with only a small percentage of them receiving hearing aid therapy. The implication of these findings is the need for increased awareness and accessibility to health services that include early diagnosis and appropriate treatment for the elderly with presbycusis. Suggestions for future research are to conduct a more in-depth study of the factors that cause presbycusis, such as medical history, lifestyle, and living environment, and observe the effectiveness of hearing aid therapy for presbycusis patients in improving their overall quality of life. This is expected to make a significant contribution to efforts to prevent and handle presbycusis more effectively.

REFERENCES

Abramoff, B., & Caldera, F. E. (2020). Osteoarthritis: pathology, diagnosis, and treatment options. *Medical Clinics*, *104*(2), 293–311.

Ambriz Murillo, Y., Menor Almagro, R., Campos-González, I. D., & Cardiel, M. H. (2015). Calidad de vida relacionada con la salud en artritis reumatoide, osteoartritis, diabetes mellitus, insuficiencia renal terminal y población geriátrica. Experiencia de un Hospital General en México. *Reumatología Clínica*, *11*(2), 68–72. https://doi.org/https://doi.org/10.1016/j.reuma.2014.03.006

Contributors, W. (2023). *Panakkukang, Makassar*. Id.Wikipedia.Org. https://id.wikipedia.org/w/index.php?title=Panakkukang,_Makassar&oldid=24016375

Deyle, G. D., Allen, C. S., Allison, S. C., Gill, N. W., Hando, B. R., Petersen, E. J., Dusenberry, D. I., & Rhon, D. I. (2020). Physical therapy versus glucocorticoid injection for osteoarthritis of the knee. *New England Journal of Medicine*, *382*(15), 1420–1429.

Fernandes, L., Storheim, K., Sandvik, L., Nordsletten, L., & Risberg, M. A. (2010). Efficacy of patient education and supervised exercise vs patient education alone in patients with hip osteoarthritis: a single blind randomized clinical trial. *Osteoarthritis and Cartilage*,

18(10), 1237–1243.

Goff, A. J., Silva, D. D. O., Merolli, M., Bell, E. C., Crossley, K. M., & Barton, C. J. (2021). Patient education improves pain and function in people with knee osteoarthritis with better effects when combined with exercise therapy: a systematic review. *Journal of Physiotherapy*, *67*(3), 177–189.

Grässel, S., & Muschter, D. (2020). Recent advances in the treatment of osteoarthritis. *F1000Research*, *9*.

Hansson, E. E., Jönsson-Lundgren, M., Ronnheden, A.-M., Sörensson, E., Bjärnung, Å., & Dahlberg, L. E. (2010). Effect of an education programme for patients with osteoarthritis in primary care-a randomized controlled trial. *BMC Musculoskeletal Disorders*, *11*, 1–7.

Hawker, G. A. (2019). Osteoarthritis is a serious disease. *Clin Exp Rheumatol*, *37*(Suppl 120), 3–6.

Hidayati, P. H., Yanti, A. K. E., Sam, A. D. P., & Abdullah, R. P. I. (2023). Karakteristik Pasien Osteoarthritis pada Unit Rawat Jalan di Rumah Sakit Ibnu Sina Makassar Tahun 2018-2021. *Fakumi Medical Journal: Jurnal Mahasiswa Kedokteran*, *3*(3), 178–189.

Hunter, D. J., March, L., & Chew, M. (2020). Osteoarthritis in 2020 and beyond: a Lancet Commission. *The Lancet*, *396*(10264), 1711–1712.

Messier, S. P., Loeser, R. F., Miller, G. D., Morgan, T. M., Rejeski, W. J., Sevick, M. A., Ettinger Jr, W. H., Pahor, M., & Williamson, J. D. (2004). Exercise and dietary weight loss in overweight and obese older adults with knee osteoarthritis: the Arthritis, Diet, and Activity Promotion Trial. *Arthritis & Rheumatism*, *50*(5), 1501–1510.

Sacitharan, P. K. (2019). Ageing and osteoarthritis. *Biochemistry and Cell Biology of Ageing: Part II Clinical Science*, 123–159.

Samvelyan, H. J., Hughes, D., Stevens, C., & Staines, K. A. (2021). Models of osteoarthritis: relevance and new insights. *Calcified Tissue International*, *109*(3), 243–256.

Sharma, L. (2021). Osteoarthritis of the knee. *New England Journal of Medicine*, *384*(1), 51–59.

Sinatti, P., Sánchez Romero, E. A., Martínez-Pozas, O., & Villafañe, J. H. (2022). Effects of patient education on pain and function and its impact on conservative treatment in elderly patients with pain related to hip and knee osteoarthritis: a systematic review. *International Journal of Environmental Research and Public Health*, *19*(10), 6194.