

ORIGINAL ARTICLE

Attitude towards elderly among Health Science Students in UiTM Selangor

Nurul Aida Jusoh, Ahmad Kamal Mohd Natar

Centre of Occupational Therapy Studies, Faculty of Health Sciences, Universiti Teknologi MARA (UiTM), Kampus Puncak Alam, 42300 Bandar Puncak Alam, Selangor, Malaysia

Abstract:

Background: To date, the elderly population is gradually increased in worldwide including in Malaysia. The negative attitude toward older people among health care professional are usually observed. **Aim:** This study was conducted to determine level of attitude towards elderly and to identify any significant difference between attitude toward elderly and demographic factors such as age, gender, type of programmes, year of study, experiencing living with elderly, taken of gerontology course and exposure to clinical placement among health science students. **Method:** A cross-sectional design was used with 314 respondents. Data was collected using demographic characteristic and Kogan's Attitude Towards Older People (KAOP) scale. Data was analyzing by SPSS-21 using descriptive statistic and non-parametric test such as Mann Whitney U and Kruskal Wallis. **Result:** The mean age and standard deviation was 22.34 ± 1.598 . The result showed that the mean of KAOP score was 126.26 ± 10.246 . Majority of the health science students had slightly positive attitude towards the elderly (75.2%) and occupational therapy students more positive attitude. Type of programmes ($\chi^2=16.177$, $p=0.024$), year of study ($\chi^2=10.455$, $p=0.015$) and taken of gerontology course ($\chi^2=10.831$, $p=0.001$) were significant towards attitude. **Conclusion:** The result of the study will contribute to the healthcare professional in improving the attitude towards elderly among the health science students in providing good quality of the treatment.

Keywords: Attitude, elderly; health science, KAOP scale

*Corresponding Author

Ahmad Kamal Mohd Natar
akamal6001@uitm.edu.my

1. INTRODUCTION

Attitude can be defined as a perception that expresses by the person to another person, objects or condition that resulting from the experiences and reactions [12]. The definition attitude is as to how people think and then reflecting the other's behaviour [3]. Study stated that attitudes play a key role in people's behavior [24]. Based on the study classified the attitude into six levels which are very negative, negative, slightly negative, slightly positive, positive and very positive that based on KAOP score [17].

The demand for healthcare professionals will be increase for the upcoming few decades [3]. As an individual is an increase in age, the health status will be impacted. So, they will require a health care provider in treating or caring for their health. In Malaysia, the term 'elderly' is classified as an adult aged 60 years and above while other countries classified elderly as aged 65 years and above [1]. The positive attitude among the health science students was the important aspect that needs to be emphasizing because in

delivering a good quality of health care service for older people [3].

Study found that more than half of the nursing and medicine students at University Putra Malaysia had negative attitudes toward the elderly [5]. There are many factors that influence personal attitude towards the elderly among undergraduate students. Based on the previous study, the attitudes toward the elderly among the health science students may influence by demographic factors such as the age, gender, year of study, type of programmes, experiencing living with the elderly, taken of gerontology course and exposure to the clinical placement.

In Sweden, the age had a relationship with the attitudes towards the elderly [9]. Besides, gender was the one factors that affect the attitude towards the elderly [9]. The result showed that male students more positive than female. Several studies had found significant between the year of study and attitude towards the elderly [3]. A study found that the senior students had more positive than junior students [9]. The previous study had found that the students who take the

gerontology course were influences to have positive the attitude towards older people [20]. But it differed from other study [5], they found that attitude towards the elderly had not to influence by exposure to the gerontology course. The other demographic factor such as past experience living with elderly was influencing the student's attitude towards the elderly [4].

Majority of the studies were focused on nursing students compared to the other health care professionals such as occupational therapy, physiotherapy, medical imaging, medical laboratory technology, environmental health and safety, nutrition and dietetics and optometry students. However, limited studies that had been published regarding the information about attitude towards the elderly among health sciences students especially in Malaysia. Then, there is a need for this study to be conducted.

2. METHODOLOGY

Research Design

A cross-sectional study design was used in this study. There were no missing participants to follow up because they will involve only one contact [16].

Subject and recruitment procedure

Data was collected at Faculty of Health Science that consists of eight programmes which are nursing, occupational therapy, physiotherapy, medical imaging, medical laboratory technology, environmental health and safety, nutrition and dietetics and optometry. Data collection was administered between December 2018 to April 2019. Formal permission to conduct the study was obtained from the head of the Faculty of Health Science. All the respondents that have specific criteria in inclusion criteria are inviting to participate in the study. The data was collected using an online survey. The respondents will briefly explain the aim of the study and consent form was given. When the consent was obtained, they were requested to complete survey questionnaire by self-administered. The questionnaire is structured into two sections which are demographic characteristics and Kogan's Attitude toward Old People (KAOP) Scale. Lastly, the data collected were analyzed.

Research tool

The questionnaire consists of two part which are demographic information and Kogan's Attitude towards Old People (KAOP) scale.

The demographic information consist of age, gender, type of programmes, year of study, taken of gerontology course, experience living with the elderly and exposure to clinical placement. The KAOP scale was developed by Kogan in 1961. This questionnaire is self-administered and is used to determine the attitude toward elderly among Health Science students in Uitm Selangor, Puncak Alam campus. The KAOP scale consists of 34 statements that divided into 17 positive statements and 17 negative statements. The aged of 60 years and above is referring to elderly people. There is 6-point Likert scale such as strongly disagree, disagree, slightly disagree, slightly agree, agree and strongly agree that corresponding to 1 to 6 respectively. The scoring for the negative statement was reversed. The minimum score is 34

and the maximum score is 204 [2]. According to Doherty, Mitchell and O'Neill (2011), they cut off the KAOP score into 6 level which are very negative (34 to 62.3), negative (62.4 to 90.7), slightly negative (90.8 to 119.1), slightly positive (119.2 to 147.5), positive (147.6 to 175.9) and very positive (176 to 204). This instrument was found to be a valid and reliable tool in assessing the attitude towards older people with Cronbach's alpha 0.80 to 0.87 [22]. The KAOP scale was widely used by the researchers to determine the attitudes towards the older people among the healthcare profession. The KAOP scale has been translated into various languages such as Japanese, Swedish, Greek and Iranian.

Data analysis

The demographic characteristic of the participants was analyzed using a descriptive statistic that consists of mean, standard deviation, frequency and percentage. For the first objective, the descriptive statistic for the level of attitude towards the elderly was carried out. The frequency and percentage will be obtained and tabulated in the table. For the second objective, the non-parametric test will be used in identifying the significant difference between attitude and demographic characteristic such as age, gender, type of programmes, year of study, experience living with the elderly, taken of gerontology course and exposure to the clinical placement. The Mann Whitney U test was used if to compare mean between two groups but the Kruskal Wallis test was used when to compare mean between three and more group. The demographic factors were considered had significant differences if the statistical parameter p-value was less than 0.05 ($p < 0.05$). The mean rank also was used to determine the level of attitude toward the elderly.

3. RESULT AND DISCUSSION

3.1 Descriptive statistics of demographic characteristics

Table 3.1 presents the detail of 314 respondents that participated in this study regarding the demographic characteristic. The mean for age was 22.34 ± 1.598 . Majority of the respondents was 21 to 23 years old 195(62.1%). Most of the respondents that participate in the survey were female 273 (86.9%). There are eight types of programmes had being involved in the present study as Shown in table 3.1 Then, 126(40.1 %) respondents were identified and represented by year four students. Furthermore, 39.5% of the students were not took a gerontology course. Then, more than half of respondents were had experience living with the elderly (77.4). A common number of months living with the elderly were 1 to 12 months with 30.6%. Next, the majority of the respondents were exposed to clinical placement with 57.6%. The respondents' commonly expose to clinical placement with one to three months.

Table 3.1 Descriptive statistic of respondents according to the demographic characteristic (n = 314)

Variables	n	%	Mean \pm SD
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Age			22.34±1.598
18-20	52	16.6	
21-23	195	62.1	
24-26	67	21.3	
Gender			
Male	41	13.1	
Female	273	86.9	
Programmes			
Occupational Therapy	40	12.7	
Nursing	36	11.5	
Medical Imaging	37	11.8	
Nutrition and Dietetics	39	12.4	
Medical Laboratory Technology	40	12.7	
Environment and Health Safety	42	13.4	
Physiotherapy	41	13.1	
Optometry	39	12.4	
Year of study			
Year 1	60	19.1	
Year 2	44	14.0	
Year 3	84	26.8	
Year 4	126	40.1	
Taken of gerontology course			
Yes	124	39.5	
No	190	60.5	
Experience living with the elderly			
Yes	243	77.4	
No	71	22.6	
If yes, please state the number of months living with the elderly			
1-12 Months	96	30.6	
13-24 Months	28	8.9	
25-36 Months	19	6.1	
37-48 Months	12	3.8	
49 Months and above	88	28.0	
Exposure to the clinical placement			
Yes	181	57.6	
No	133	42.4	
If yes, please state the number of months that expose to the clinical placement			
1 -3 Months	68	21.7	
4-6 Months	65	20.7	
7-9 Months	23	7.3	
10-12 Months	25	8.0	

3.2 The attitude towards elderly among health science students in UiTM Selangor.

The mean and standard deviation for the KAOP score was 126.26 ± 10.246 . Figure 3.1 showed the frequency and percentage of level attitude towards elderly among health science students. There were 75.2% of respondents presented a slightly positive attitude towards the elderly, 22.0% of respondents were slightly negative and 2.9% respondents were a positive attitude towards the elderly. Attitude towards the elderly among university students that

studying in different fields was generally had a positive attitude [10].

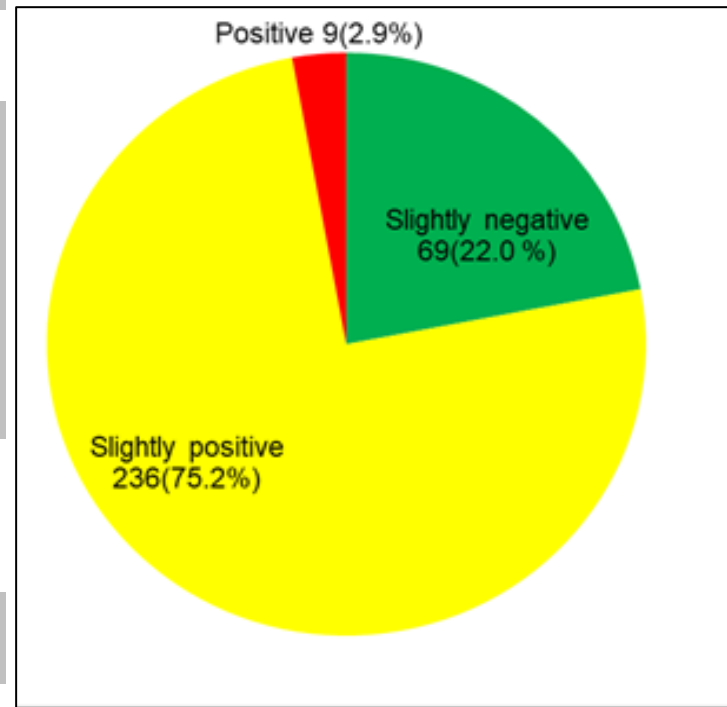


Figure 4.1 Frequency and percentage of level attitude towards elderly among health science students

The result presented that occupational therapy students had a more positive attitude towards the elderly. Then, it followed by environmental health and safety, optometry, physiotherapy, medical laboratory technology, nursing, medical imaging, and nutrition and dietetics programme. Occupational therapy had a more positive attitude because most of them were taking a gerontology course. Similarly with this present study that showed the occupational therapy more positive than the physiotherapy and the dietician students. Another study by Kaker, Ovsenik, and Zupančič (2016) also showed that the physiotherapy students more negative compared to social gerontology students.

It contradicted with the other study that found the physiotherapy students seem to have more positive attitudes [7]. Next, the study that had been conducted, it revealed that nursing students in Poland showed a more negative attitude towards the elderly [19]. This finding supports the result that had been found in this present study because of the nursing student more negative than the other programmes.

3.3 Significant difference between level of attitude toward elderly and socio-demographic factors

3.3.1 Age

The age of the respondents not normally distributed due to randomly involve and participate in the survey. From this study found that the age and attitude towards the elderly had no significant difference ($p= 0.110$). Most of the studied had shown a significant difference. The finding showed the

age of the Jordanian nursing had significant difference towards the level of attitude [9]. They stated that as the age increase, the students' attitude towards the elderly were more positive. Besides, studies found significant between the age and level of attitude [5, 19]. But most of 20 to 25 years old had a negative attitude towards the elderly with 59.8% [19]. The result of this study showed 21 to 23 years old were more positive than 18 to 20 and 24 to 26 years old. There is no powerful reason why those 21 to 23 years old had more positive than the other age. From the observation, 21 to 23 years old students were commonly in year three or year four. Based on the observation, the students in these years were more to expose with the clinical placement.

3.2.2 Gender

The gender distribution in the Faculty of Health Science was more female than male. It is no surprise if the respondents in this study are more female than. Another reason was the female students are more willing to involve in the survey. The result was found that the male students had more positive than female students with mean rank 173.77 and 155.06 respectively. Table 3.2 showed that there was no statistically significant between gender and level of attitude towards the elderly ($p= 0.218$). It was supported by a study by Ahmad Anwar Bashah and Mohd Nordin, 2016;[5]. The several studies were found there was a significant difference between gender and attitude towards the elderly [14][11]. As a result by Kaker et al. (2016), the female students were a more positive attitude and appreciate the elderly people than male.

3.2.3 Type of programmes

The finding reported that the occupational therapy students had a more positive attitude with mean rank 191.94 followed by environmental health and safety, optometry, physiotherapy, medical laboratory technology, nursing, medical imaging, and nutrition and dietetics programme. Table 3.2 showed there was a significant difference between the type of programmes and level of attitude towards the elderly ($p = 0.024$). This finding was correlated with the study that had been conducted in Poland showed that the attitude towards the elderly and the type of programmes had significant different [19]. The reason that had been stated by them was a lack of knowledge regarding the growing process for old people that lead to a negative attitude.

3.2.4 Year of study

The result based on table 3.2 was found that the year one student was more positive with mean rank 188.33 than followed by year four, year three and year two students. The result of this present study showed that there is a significant difference between year of the study and level of attitude ($p=0.015$). Similarly with the several studies that showed a significant difference towards the attitude [1]. Year one student's a more negative attitude towards the elderly than fourth years students because of newbies and they did not have more knowledge in handling the elderly [1]. However, the attitude towards the elderly among students may increase and have progressed as the year of the study

increased. Besides, the study that conducted in University Putra Malaysia also found a significant difference between a year of study and level of attitude [5]. Soderhamn et al. (2011) stated that the first-year students presented a more positive attitude towards the elderly compared the third-year students. The reasons were some of the students in year one was started exposure to the clinical placement in certain programmes and the awareness regarding the elderly had been exposed during secondary school that may affect the positive attitude. But, it contradicted with the study that showed no significant difference [9].

3.2.5 Taken of gerontology course

Based on table 3.2 the health science students who take gerontology course had a more positive attitude towards the elderly with mean rank 178.35. There was a significant difference had found between taken of gerontology course and level of attitude ($p= 0.001$). Physiotherapy and occupational therapy programme showed a high percent in taking of gerontology course. It was correlated to the study that had been conducted and found that the physiotherapy students who take the gerontology course were influences to have a positive attitude towards the elderly [20]. Similarly with the study found that the health science students had a more positive attitude when they were exposing to the gerontology course [17]. Besides, the results showed no significant difference was found between attitude towards the elderly and taken of gerontology course [5]. A study highlighted that the education was one of the ways that able to promote the attitude towards elderly among the students who studying in health-related care but not all the health science programme include in the curriculum [23].

3.2.6 Experience living with elderly

Majority of the students having experience living with the elderly and they had more positive towards the elderly with mean rank 157.58. This presents study showed that there is no statistical difference between the experiences living with the elderly and the level of attitude towards the elderly ($p=0.976$). The study conducted at the Faculty of Medicine and Health Science, University Putra Malaysia, Malaysia support this study [24][5]. Besides, [11] also had a similar result that showed students who live with the elderly more positive attitude, respect and appreciation towards elderly people. The reason why they had a good attitude when had experience living with the elderly was they had more understood the elderly people limitation and more respect because all every people will face that particular stage one time.

3.2.7 Exposure to clinical placement

The result had been tabulated in Table 3.2. The presents study found that the students who not exposure to the clinical placement had more positive with mean 158.80. Finally, this study found that there is no significant between the exposure to clinical placement and level of attitude towards the elderly ($p= 0.828$). But the students who had exposure with clinical placement had a more negative attitude towards the elderly. But study stated that the

exposure to clinical placement was able to promote a positive attitude towards the elderly for future elderly patient care [17].

Table 3.2 Descriptive statistics type of programmes and level of attitude (n=314)

Variables	χ^2	df	Mean rank	p-value
Age	4.417	2		0.110
18-20			141.33	
21-23			165.64	
24-26			144.91	
Gender	1.517	1		0.218
Male			173.77	
Female			155.06	
Programmes	16.177	7		0.024
Occupational Therapy			191.94	
Nursing			145.28	
Medical Imaging			143.99	
Nutrition and Dietetics			123.33	
Medical Laboratory Technology			148.01	
Environment Health and Safety			174.90	
Physiotherapy			154.54	
Optometry			174.55	
Year of study	10.455	3		0.015
Year 1			188.33	
Year 2			137.14	
Year 3			146.19	
Year 4			157.47	
Taken of gerontology course	10.831	1		0.001
Yes			178.35	
No			143.89	
Experience living with the elderly	0.001	1		0.976
Yes			157.58	
No			157.22	
Exposure to the clinical placement	0.047	1		0.828
Yes			156.55	
No			158.80	

4. CONCLUSIONS

In conclusion, this study proves the demographic factor influence the attitude towards the elderly among health science students. Moreover, the study found that the attitude among occupational therapy more positive attitude. The overall attitude among health science students was slightly positive. To my knowledge, there is a lot of studies that had been done on nursing students compared the other healthcare-related. It is because they have seen the nursing profession more contact with the elderly. Thus, this study

adds a significant contribution to fill the current gap literature regarding the attitude towards the elderly among the health science students in UiTM. Therefore, the result in the present study found that the type of programmes, year of study and taken of gerontology course was significant towards the attitude towards the elderly.

The result of the study will contribute to the healthcare professional to improvised the attitudes toward the elderly among the health science students in providing the good quality of the treatment. To improve the attitude toward the elderly, the training programme and a few strategies will be suggested. Next, the implication of the study for educators in Uitm Selangor should build the knowledge and the action in improving the attitude towards elderly from negative to positive. They also need to plan strategies such as reviewing the existing curriculum and adding gerontological care education.

The first limitation that had been found in this study was the only health science students in one university that involved. The study should be widened the study population to all institution around Malaysia that involving public and private universities. Then, the second limitation was only degree health science students were involved in this study. The further studies should be an involved foundation, diploma, degree and master students. Another limitation was the study design which is a cross-sectional study. It is because of the respondents' only contact for one time. The longitudinal research for future studies also recommended. It should be conducted before, during and after exposure to interventions in order to obtain a more accurate finding. The self-report questionnaires such as the KAOP scale will depend on the honesty of the respondents in answering the questions. So, the accuracy of the result will be affected. The further studies using interview is better to be done among health science students in obtaining the accuracy of the result.

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REFERENCES

- [1] Ahmad Anwar Bashah, F., & Mohd Nordin, M. Z. (2016). Attitudes among Medical Imaging Students towards older adults in Malaysia : A Preliminary Study. *Environmental-Behaviour Proceedings Journal*, 1(3), 9–10. <https://doi.org/10.21834/e-bpj.v1i3.353>
- [2] Cheong, S. K., Med, M. M. F., Wong, T. Y., Med, M. M. F., Koh, G. C. H., & Med, M. M. F. (2009). Attitudes

- Towards the Elderly among Singapore Medical Students, 38(10), 857–861.
- [3] Chung, J.C.C. (1995). Attitudes of occupational therapy students toward older people in Hong Kong. *Occupational Therapy International*, 278–290.
- [4] Coffey, A., Buckley, C., Murphy, E., McCarthy, G., Gaidys, U., Sansoni, J., Arola, M., Deimante-hartmane, D., Auer, S., Corvo, E., Petersen- Ewert, C. (2015). Attitudes to ageing and perceptions of working with older people of students of health and social care. *Irish Journal of Medical Science*, 1), S381. Retrieved from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&CSC=Y&NEWS=N&PAGE=fulltext&D=emed16&AN=71611356%5Cnhttp://bf4dv7zn3u.search.serialssolutions.com.myaccess.library.utoronto.ca/?url_ver=Z39.88-2004&rft_val_fmt=info:ofi/fmt:kev:mtx:journal&rft_id=info:sid/Ovid:emed16
- [5] Damulak, P. P., Minhat, H. S., & Rahman, A. A. (2015). Attitude towards the Elderly among Healthcare Related Students in Malaysia. *International Journal of Health Science and Research*, 5(11), 248–258.
- [6] Engström, G., & Fagerberg, I. (2011). Attitudes towards older people among Swedish health care students and health care professionals working in elder care. *Nursing Reports*, 1(1), 2. doi: 10.4081/nursrep.2011.e2
- [7] Fleming, C. J., & Shultz, J. E. (1997). A Comparison of the Knowledge, Misconceptions, and Attitudes Toward the Elderly of First Versus Final Year Students in Accredited Physical Therapy Programs
- [8] Hovey, S., Dyck, M. J., Reese, C., & Kim, M. J. (2017). Nursing students' attitudes toward persons who are aged: An integrative review. *Nurse Education Today*, 49, 145–152. <https://doi.org/10.1016/j.nedt.2016.11.018>
- [9] Hweidi, I. M., & Al-Obeisat, S. M. (2006). Jordanian nursing students' attitudes toward the elderly. *Nurse Education Today*, 26(1), 23–30. <https://doi.org/10.1016/j.nedt.2005.06.003>
- [10] Istanb, N. C. (2018). Investigation of the attitudes of university students to discrimination of the elderly, 5(1), 25–30. <https://doi.org/10.14744/nci.2017.10437>
- [11] Kaker, D. J., Ovsenik, M., & Zupančič, J. (2016). Attitudes of Social Gerontology and Physiotherapy Students Towards the Elderly, 49(1), 55–69. <https://doi.org/10.1515/orga-2016-0002>
- [12] Lambrinou, E., Sourtzi, P., Kalokerinou, A., & Lemonidou, C. (2009). Attitudes and knowledge of the Greek nursing students towards older people. *Nurse Education Today*, 29(6), 617–622. doi: 10.1016/j.nedt.2009.01.011
- [13] Neville, C. (2015). Nurse Education Today Undergraduate nurse attitudes toward older adults and perceptions of working with older adults: An analysis of measurement instruments. *YNEDT*, 35(1), 183–188. <https://doi.org/10.1016/j.nedt.2014.09.001>
- [14] Özer, Z., & Terkeş, N. (2014). Evaluation of Nursing Student's Attitudes towards Ageism in Turkey. *Procedia - Social And Behavioral Sciences*, 116, 2512–2515. doi: 10.1016/j.sbspro.2014.01.602
- [15] Rathnayake, S., Athukorala, Y., & Siop, S. (2016). Attitudes toward and willingness to work with older people among undergraduate nursing students in a public university in Sri Lanka: A cross sectional study. *Nurse Education Today*, 36, 439–444. <https://doi.org/10.1016/j.nedt.2015.10.007>
- [16] Sedgwick, P. (2014). Cross sectional studies: advantages and disadvantages. *BMJ*, 348(mar26 2), g2276-g2276. doi: 10.1136/bmj.g2276
- [17] Singh, D., Subramaniam, P., Ab. Rahman, N., Rusly, F., & Ghazali, S. (2018). Knowledge And Attitude Towards Ageing Among Health Science University Students. *Journal Of Liaquat University Of Medical & Health Sciences*, 17(01), 36–41. doi: 10.22442/jlumhs.181710546
- [18] Söderhamn, O., Lindencrona, C., & Gustavsson, S. M. (2001). Attitudes toward older people among nursing students and registered nurses in Sweden. *Nurse Education Today*, 21(3), 225–229. <https://doi.org/10.1054/nedt.2000.0546>
- [19] Strugala, M., Talarska, D., & Whysocki, J.(2016). Attitudes Towards the Elderly among Nursing Students in Poland—Initial Findings. *Journal of Gerontology & Geriatric Research*, 5(1), 1–8. doi: <https://doi.org/10.4172/2167-7182.1000279>
- [20] Taylor, L. & Tovin, M. (2000). Student Physical Therapists' Attitudes Toward Working with Elderly Patients, 18(2), 21–37.
- [21] Usta, Y. Y., Demir, Y., Yönder, M., & Yildiz, A. (2012). Nursing students' attitudes toward ageism in Turkey. *Archives of Gerontology and Geriatrics*, 54(1), 90–93. <https://doi.org/10.1016/j.archger.2011.02.002>
- [22] Wai, R. K., Hong, T., & Polytechnic, K. (2014). Promoting Positive Attitude towards Elderly among Healthcare Students through Service Learning, 142–151.
- [23] Yazici, S., Kalayci, I., Kaya, E., & Tekin, A. (2016). Attitudes of Students Studying In Health Related Departments towards the Elderly. *Gaziantep University Journal Of Social Sciences*, 15(24217), 601–614. doi: 10.21547/jss.25671
- [24] Zambrini, D.A.B., Moraru, M., Hanna, M., Kalache, A., & Nunez, M. (2008). Attitudes Toward the Elderly Among Students of Health Care Related Studies at the University of Salamanca, Spain, *Journal of Continuing Education in The Health Professions* 28(2), 86–90. doi: [https://doi.org/10.1002/chpWabe, N.T., et al., "Medication adherence in diabetes mellitus and self management practices among type-2 diabetics in Ethiopia," North.Am.J.Med.Sci.: 3: 418-423, 2011.](https://doi.org/10.1002/chpWabe, N.T., et al.,)