



Knowledge, Attitudes and Beliefs of Adults and Elderly Outpatients Regarding Pneumococcal Vaccination at Taif Hospital Cluster

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Authors' contributions

This work was carried out in collaboration among all authors. Author TA designed the study, performed the Questionnaire design and author MSA wrote the final draft of the manuscript. Author TA managed the Data acquisition and data entry. Author MSA managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

The whole world is invaded by many micro organisms which are not only killing people but also ruining the quality of life of the people worldwide. Vaccination against major micro-organism is the only way out to protect the people. Pneumonia and influenza are two leading causes of death especially the elderly within the globe.

Objective of the Study: It was to assess knowledge, attitudes, and beliefs of adults and elderly outpatients regarding pneumococcal vaccination at the Taif hospital cluster and to understand the factors that may influence pneumococcal vaccination among the elderly and younger adults.

Materials and Methods: It was a cross sectional questionnaire study where Self-administered Monkey surveys was administered to a cohort of elderly and younger adult participants. The study was conducted for 4 months. Age group of the participants were within 20 - >80 years and included both Saudi and Non Saudi individual. The collected data were subjected to descriptive analysis to

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obtain the frequencies of the different variables and the correlation between them using cross tabs, paired-sample T-test, and Pearson's Chi-square. p-value < 0.05 was taken as significant.

Results: Overall 301 people participated in the study (response rate 91%). A total of 32.56% responded that they had received the pneumococcal vaccine. From the respondents above 12.45% were between 20-40 years old, 10.72% between 41-60 years old, and 8.65% between 61-70 years and 2.07% between 71 to > 80 years of age, indicating lower rates of vaccination among the elderly. Vaccination depends on the patient's health conditions. Despite the positive knowledge, attitudes, and beliefs of the participants about the importance of the vaccine, yet they did not respond well to take the vaccine as recommended by the international health authorities.

Conclusion: From the present study it can be concluded that gender has no statistically significant association with vaccination. More is the education more is the adherence to vaccination. Saudi nationals adhered more to vaccination as compared to non Saudi. The results from our study showed that healthcare guidance and recommendation significantly influenced vaccine uptake in both the elderly and younger adults

Keywords: Invasive pneumococcal disease; elderly adults; vaccination; pneumococcal infection; polysaccharide pneumococcal vaccine.

1. INTRODUCTION

Pneumonia is an invasive worldwide disease caused by gram-positive pneumococcal bacterial pathogens. Global statistics showed that about 14.5 million people had the incidence of severe pneumococcal infections. The infection varies from being as mild as sinusitis and otitis media to the more severe including septicemia, meningitis, and pneumonia [1]. Pneumonia disease showed the highest morbidity and mortality in healthcare settings in comparison with other infectious diseases. The infection was highly prevalent among younger children below 5 years of age and elderly adults aged 60 years and an estimation of about 5% of pneumococcal pneumonia infected Americans mainly die with septicemia and meningitis at respective rates of 20% and 30% [2].

Schneeberg et al reported an increased risk of pneumococcal pneumonia among people with morbid medical conditions, including chronic liver, lung or heart diseases, as well as sickle cell anemia [3]. A study conducted in Saudi Arabia reported that the point prevalence of community-acquired pneumonia (CAP) in hospitalized patients was 30.3% with peak prevalence in patients over 50 years, while the point prevalence of hospital-acquired pneumonia (HAP) was 4.4%. Another study on 567 pneumonia patients at an average age of 42.7 (\pm 21.9) years showed that 2.3% of them have experienced non-fatal complications and 6% died due to pneumonia.

Antibiotics are among the most prescribed medications for the treatment of pneumococcal

pneumonia infection, an estimated time span between 12 to 36 hours from the start of taking the antibiotics are needed for the symptoms to disappear [4].

Vaccines may have their own side effects, like fever, rashes, itchy areas, pin at the site of injection and most severe form Anaphylaxis. To avoid few of them in the elderly people later in 2012, the 13- valent the pneumococcal conjugate vaccine was recommended for the 50 years old adults. The conjugated vaccine is prepared from polysaccharides of 13 different serotypes of *S. pneumonia* conjugated to diphtheria cross-reactive material 197 (CRM197) proteins. Since then, the 13 valent conjugate vaccines were also recommended for Canadian infants and adults with specific health conditions that may increase the risk for pneumococcal infection. Vaccines helps to make antibodies in the body in advance so that whenever the person faces the threat of fresh infection from outside then they can neutralize the same. People till the age of 60 are considered as adults and more than that are considered elderly. Elderly people in general especially those with certain comorbidities are at high risk for morbidity and mortality from serious pneumococcal infections. The use of polyvalent pneumococcal vaccine in elderly subjects has potentially controlled such infections; however, the acceptance of elderly people to take the vaccine is controversial due to the lack of knowledge and belief about the efficacy and safety of vaccination among this population. It is therefore essential to understand the different factors that affect the pneumococcal vaccine uptake in elderly adults in order to develop an

intervention target to promote pneumococcal vaccination in this age group [5].

To the best of our knowledge, most researches initiated in the Kingdom was to study the prevalence of pneumonia complications among Saudi adults with little focus on the possible barriers such as lack of knowledge, negative attitudes and belief of the elderly that may hinder their acceptance to have the pneumococcal vaccine [6]. Accordingly, our objective was to understand the knowledge, attitudes, and beliefs of younger adults and elderly adults regarding their acceptance to take the pneumococcal immunization. Understanding such variables and factors which could enhance or hinder pneumococcal vaccine uptake among elderly and younger adults in hopes of improving vaccine coverage in this higher-risk age group.

2. MATERIALS AND METHODS

2.1 Study Design, Sample Size, and Selection Criteria

It was a cross sectional questionnaire study. The current study is planned to be covered in 4 months and will be distributed as followed.

Phase I: 1-month duration

- Planning of the study
- Surveying related literature.
- Establishing standard criteria
- Providing validated questionnaire
- Approval and registration of the study.
- Receiving permission from the hospital authority

Phase II: 1-month duration

Questionnaire distribution and collection.

Step III: 1-2 months duration

- Statistical analysis of the obtained data.
- Interpretation of the results.
- Results and discussion
- Drawing conclusion and establishing recommendations.

2.2 Sample Size

A total of 301 Participants (vaccinated and unvaccinated).

2.3 Study Instrument

Self-administered cross-sectional questionnaire.

- **Study Site:** Taif health cluster
- **Study Duration:** 4 months

2.4 Inclusion Criteria

- Pneumococcal vaccinated and unvaccinated outpatients
- Males and females
- Age group 20 - >80 years
- Saudi and non-Saudi
- Attending different hospital departments.

2.5 The Questionnaire

A modified self-administered questionnaire is based on the theory of planned behavior and the health belief model is employed in Arabic and English. A set of three questions on the subject's knowledge of pneumococcal infection and immunization, three on perceived vaccination risk, three on personal normative beliefs, six on attitude toward vaccines, three facilitating conditions for vaccination, seven respondent characteristics [7].

2.6 Statistical Analysis

Data was analyzed using Statistical Package for Social Studies (SPSS 23; IBM Corp., New York, NY, USA). Continuous variables were expressed as mean \pm standard deviation. Categorical variables were expressed as percentages. The t-test and One-Way Analysis of Variance (ANOVA) will be used. Cronbach's alpha was used to assess the reliability and internal consistency of the items in the questionnaire. Pearson's correlation coefficient was employed to assess any correlation between the participant's characteristics and Knowledge attitude and Behavior (KAB). P-value <0.05 was considered statistically significant.

3. RESULTS

The sociodemographic characteristic of the study respondents is presented in Table 1. A rate of 301 completed their questionnaires through a Monkey Survey format at a response rate of 90.75%. The data in the table showed that the rate of the male respondents was 156 (51.82%) and that of the females was 145 (48.18%) showing more male respondents than females (p

= 0.000) with a mean age of 60.2 years. The respondents were unanimously Saudi 290 (96.35%, p = 0.000), with significantly different variations in their health, fitness, Income, and education levels (p = 000) for all the variables.

The data in Table 2 are a further presentation of the participant socio-demographic characteristic in relation to their vaccination status. Descriptive crosstabs statistics showed the rates and percentages of the vaccinated and the unvaccinated participants in relation to their demographic characteristics. Genders showed no significant correlation regarding vaccination status with a Chi-Square p-value (0.083). There was also no significant... correlation between participants age. Nationality and education with the vaccination status with respective p values of 0.340, 0.080, and 0.648, however, the rates of vaccination between the variables were

significant. On the contrary, a highly significant correlation was found between the participants' health, fitness, income, and the visited hospital departments with respective p values of 0.000, 0.013, and 0.024. The last row in Table 2 showed an average total vaccination compared with an average total un-vaccinated among the participants and the variation was highly significant (p = 0.000).

Fig. 1 Illustrates the percentages of vaccinated and unvaccinated participants according to the visited hospital department. The cardiology department prevailed at the highest rate of unvaccinated while the Gastroenterology and the surgery departments revealed the highest rate of vaccination. The least of vaccination was from the Coronary, Oncology, Haematology, and Nephrology in respective deciding order.

Table 1. Socio-demographic characteristics of the study respondents

Characteristics	Total participants 301 (100%)	
	Frequency (%)	Sig (p value)
Gender		
Males	156 (51.82)	0.000
Females	145 (48.18)	
Age (Years)		0.000
20-40	84 (27.90)	
41-60	95 (31.6)	
61-70	86 (28.6)	
71-80	33 (11.0)	
➤ 80 Years	3.0 (1.0)	
Nationality		0.000
Saudi	290 (96.35)	
Others	11.0 (3.65)	
Health fitness		0.000
Ver fit	32 (10.60)	
Well	98 (32.56)	
Well with treated comorbid disease	137 (45.51)	
Apparently vulnerable/ mildly frail	34 (11.30)	
Income (Saudi Riyals)		0.000
≤ 5000	116 (38.50)	
5000-10000	90 (29.90)	
1000-15000	81 (26.90)	
➤ 15000	14 (4.70)	
Education		0.000
Preparatory or less	74 (24.6)	
Secondary	56 (18.60)	
College	155 (51.50)	
Other education	16 (5.30)	

Table 2. Participant demographic characteristics by vaccination status

Characteristics	Vaccinated Frequency (%) Total 98.0 (32.56%)	Unvaccinated Frequency (%) Total 203 (61.10%)	T-TEST (Sig.)
Gender			
Males	40 (13.30%)	116 (40.13)	0.01
Females	58 (19.26)	87.0 (30.0)	
Age (Years)			
20-40	36 (12.45)	48 (16.60)	
41-60	31 (10.72)	64 (22.15)	0.01
61-70	25 (8.65)	61 (21.11)	
71-80	5 (1.73)	28 (9.69)	
80 Years	1(0.34)	2 (0.69)	
Nationality			
Saudi	94 (31.22)	196 (65.12)	0.080
Others	4 (1.33)	7 (2.33)	
Health fitness			
Ver fit	9 (2.99)	23 (7.64)	0.000
Well	46 (15.28)	52 (17.28)	
Well with treated comorbid disease	39 (12.95)	98 (32.56)	
Apparently vulnerable/ mildly frail	4 (1.32)	30 (9.97)	
Income (Saudi Riyals)			
≤ 5000	41 (13.62)	75 (24.92)	0.627
5000-10000	30 (9.97)	60 (19.93)	
1000-15000	19 (6.31)	62(20.59)	
15000	8 (2.66)	6 (1.99)	
Education			
Preparatory or less	29 (9.63)	45 (14.95)	
Secondary	19 (6.31)	37 (12.29)	0.046
College	48 (15.95)	107 (35.55)	
Other education	2 (0.66)	14 (4.65)	
Hospital department visited			
Cardiology	6 (1.99)	34 (11.29)	
Neurology	11 (3.65)	20 (6.64)	
Obstetrics/ Genecology	14 (4.65)	16 (5.32)	
Chest diseases	9 (2.99)	23 (7.64)	0.013
Coronary care	5(1.66)	15 (4.98)	
Haematology	2 (0.66)	12 (3.98)	
Nephrology	2 (0.66)	25 (8.31)	
Oncology	3 (0.99)	7 (2.33)	
Gastroenterology	23 (7.64)	24 (7.97)	
Surgery	23 (7.64)	27 (8.97)	
Average of total vaccinated	98 (32.56%)		0.000
Average of Total unvaccinated	203 (67.44%)		

The data in Table 3 are collective responses of total (vaccinated and unvaccinated) participants regarding the knowledge, attitude, and belief statements of the vaccination status. Out of the 301 participants, 206 (68.34%) strongly and somewhat agreed *with* the statements while 95

(31.56%) neither agreed or disagreed, somewhat disagreed and strongly disagreed.

The statements of the knowledge, attitudes, and beliefs *about* vaccination presented in Table 3 are further presented in Table 4 shows the

participants' responses to the knowledge, attitudes, facilitating, and normative statement according to their vaccination status. It is clear from the Table that Vaccinated participants agreed with no significant difference with the unvaccinated participants on the 3 knowledge statements "Pneumonia vaccine keeps vaccinated people from getting pneumonia" (p 0.370), the statement "I am prone of high risk for pneumonia" (0.129) and the statement "Unvaccinated person with pneumonia vaccine will probably get pneumonia" (p = 0.513).

The vaccinated participants also agreed with the unvaccinated participants on the attitude statements "Vaccinations are a practical way to protect my health" (p = 0.370), and "I believe that pneumonia vaccine is safe protection" (p = 0.078), however, they were significantly different on the other four attitude statements "In general, I consider vaccines to be safe protection", "In general, I consider vaccines to be safe protection", "I believe it is a wise idea to take the pneumonia vaccine", "I believe it is important for the healthy individual over the age of 65 to have the pneumonia vaccine" and the statement at (p < 0.05).

The unvaccinated participants showed higher rates of positive responses (strongly agree and

somewhat agree) on the normative statement "Recommendations of my doctors and *health care* providers are highly important", compared with the vaccinated participants (p= 0.015).

The data in Table 5 showed that there was no significant variation between the vaccinated and the unvaccinated participants regarding the yes and No or have no idea answers to the knowledge questions with *the highest rates* were in the no/ no idea responses "I have been told about a vaccine that protects from pneumonia" (p = 0.520); "The pneumonia vaccine and the flu vaccine are the same" (p = 0.951); "I have been told by my doctor and health care providers about the pneumonia vaccine" (p = 0.520); "My doctor and health care providers believe that, I should have the pneumonia vaccine" (p = 0.127); "Pneumonia vaccine has been offered to me by my doctor and health care providers" (0.607).

A high percentage (59.2%) of the vaccinated group said yes to the statement "I visited my primary care provider in the last year" compared with (48.7%) of the unvaccinated group and the variation between the overall positive and negative responses were insignificant between the two groups (p = 0.177).

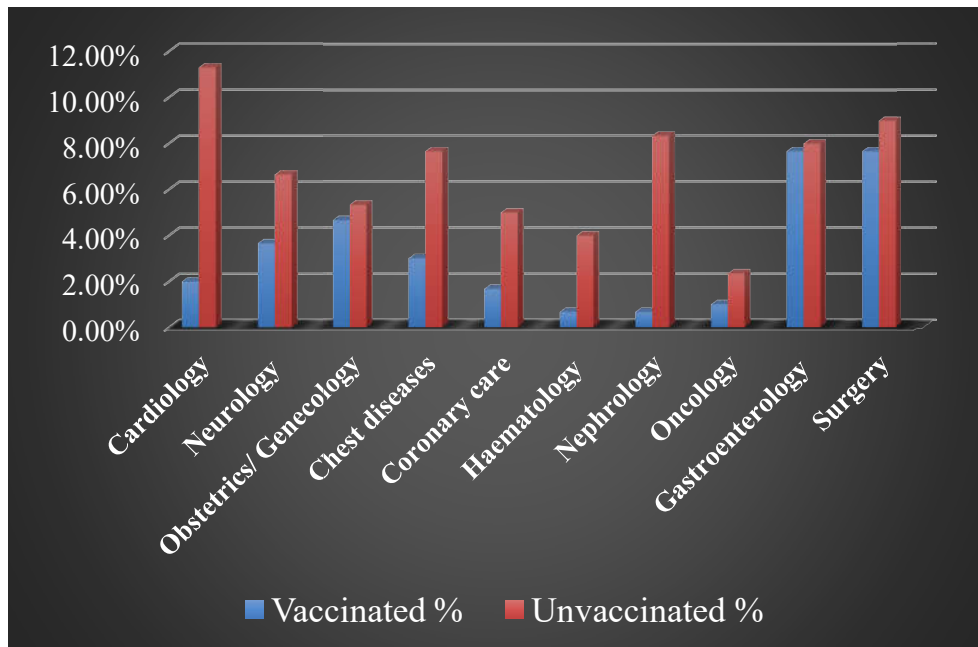


Fig. 1. Percentages of vaccinated and unvaccinated participants regarding the visited departments

Table 3. Distribution of responses of study population to knowledge, attitudes and belief questions

Statement	STA Frequency (%)	SWA Frequency (%)	NAND Frequency (%)	SWDA Frequency (%)	SDA Frequency (%)
Vaccinations are practical way to protect my health	97 (32.2)	121 (40.2)	45 (15.0)	32 (10.6)	6.0 (2.0)
In general, I consider vaccines to be a safe protection	89 (29.6)	132 (43.9)	37 (12.3)	32 (10.6)	11 (3.7)
Pneumonia is a serious communicable disease	109 (36.2)	88 (29.2)	29 (9.6)	58 (19.3)	17 (5.6)
Pneumonia vaccine keeps vaccinated people from getting pneumonia	61 (20.3)	125 (41.5)	71 (23.6)	32 (10.6)	12 (4.0)
I am prone of high risk for pneumonia	61 (20.3)	123 (40.9)	49 (16.3)	36 (12.0)	32 (10.6)
Unvaccinated person with pneumonia vaccine will probably get pneumonia	70 (23.3)	139 (46.2)	56 (18.6)	27 (9.0)	9.0 (3.0)
Recommendations of my doctors and healthcare providers are highly important	164 (54.5)	93 (30.9)	14 (4.7)	19 (6.3)	11 (3.7)
I believe it is a wise Idea to take the pneumonia vaccine	90 (29.9)	110 (36.5)	54 (17.9)	25 (8.3)	21 (7.0)
I believe it is important for health individual over the age of 65 to have the pneumonia vaccine	101 (33.6)	91 (30.2)	46 (15.3)	24 (8.0)	39 (13.0)
I believe that, pneumonia vaccine is a safe protection	79 (26.2)	113 (37.5)	44 (14.3)	43 (14.3)	22 (7.3)
Average total positive responses in terms of (STA+SWA)	206 (68.34%)				
Average total negative responses in terms of (NAND+AWDA+SDA)	95 (31.56%)				

STA= Strongly agree, SWA= Somewhat agree, neither agree nor disagree, SWDA=Somewhat disagree. SDA= Strongly disagree

Table 4. Distribution of responses to knowledge, beliefs and facilitating conditions questions by vaccination status

Statements	STA n (%)	SWA n (%)	NAND n (%)	SWDA n (%)	SDA n (%)	Chi (p)
Knowledge Statements						
Pneumonia vaccine keeps vaccinated people from getting pneumonia	23(7.6)	40(13.3)	27(9.0)	79(26.2)	1(0.3)	0.370
Vaccinated	38(12.6)	85(28.2)	44(14.6)	25(8.3)	11(3.7)	
Unvaccinated						
I am prone of high risk for pneumonia	23(7.6)	44(14.6)	13(4.3)	13(4.3)	5(1.7)	0.129
Vaccinated	38(12.6)	79(26.2)	36(12.0)	23(7.6)	27(9.0)	
Unvaccinated						
Unvaccinated person with pneumonia vaccine will probably get pneumonia	24(8.0)	49(16.3)	19(6.3)	4(1.3)	2(0.66)	0.513
Vaccinated	46(15.3)	90(29.9)	37(12.3)	23(7.6)	7(2.3)	
Unvaccinated						
Attitude statements						
Vaccinations are practical way to protect my health	33(11.0)	41(13.6)	16(5.3)	6(2.0)	2(0.6)	0.239
Vaccinated	64(2.13)	80(26.6)	29(9.6)	26(8.6)	4(1.2)	
Unvaccinated						
In general, I consider vaccines to be a safe protection	30(10.0)	46(15.3)	14(4.7)	5(1.7)	3(1.0)	0.000
Vaccinated	59(19.6)	86(28.6)	23(7.6)	27(9.0)	8(2.7)	
Unvaccinated						
I believe it is a wise Idea to take the pneumonia vaccine	37(12.3)	36(12.0)	17(5.6)	3(1.0)	5(1.7)	0.023
Vaccinated	53(17.6)	74(24.6)	37(12.3)	22(7.3)	16(5.3)	
Unvaccinated						
I believe it is important for health individual over the age of 65 to have the pneumonia vaccine	47(15.6)	26(8.6)	17(5.6)	2(0.6)	6(2.0)	0.000
Vaccinated	54(17.9)	65(21.6)	29(9.6)	22(7.3)	33(11.0)	
Unvaccinated						
I believe that, pneumonia vaccine is a safe protection	33(11.0)	37(12.3)	16(5.3)	7(2.3)	5(1.7)	0.078
Vaccinated	46(15.3)	76(25.2)	28(9.3)	36(12.0)	17(5.6)	
Unvaccinated						
Normative statement						
Recommendations of my doctors and healthcare providers are highly important	61(20.3)	28(9.3)	2(0.6)	6(2.0)	1(0.3)	0.015
Vaccinated	103(34.2)	65(21.6)	12(4.0)	13(4.3)	10(3.3)	
Unvaccinated						

Pearson's correlation in Table 6 includes the interrelation between the participants' sociodemographic characteristics and their knowledge, attitude responses represented by

the five-points Likert scale (ST1), and their knowledge, attitude, and facilitation condition represented by the Yes/ No/ I have no idea (ST2).

Table 5. Distribution of responses to knowledge, beliefs and facilitating conditions questions by vaccination status

Statement	YES	NO / NO IDEA	Chi (p)
Knowledge			
I have been told about a vaccine that protect from pneumonia			
Vaccinated	33(33.7)	65(66.3)	0.520
Unvaccinated	62(30.5)	141(69.5)	
The pneumonia vaccine and the flu vaccine are the same			
Vaccinated	24(24.5)	74(75.5)	0.951
Unvaccinated	51(25.2)	152(74.8)	
I have been told by my doctor and healthcare providers about the pneumonia vaccine			
Vaccinated	12(12.2)	86(87.8)	0.520
Unvaccinated	42(20.7)	161(79.3)	
My doctor and health care providers believe that, I should have the pneumonia vaccine			
Vaccinated	14(14.3)	84(85.7)	0.127
Unvaccinated	42(20.7)	161(79.3)	
Pneumonia vaccine has been offered to me by my doctor and health care providers			
Vaccinated	11(10.2)	87(88.8)	0.607
Unvaccinated	32(15.8)	171(84.2)	
Attitude			
Using vaccines are very important to prevent disease like pneumonia			
Vaccinated	58(59.2)	40(40.8)	0.289
Unvaccinated	106(52.2)	97(47.8)	
Facilitating condition			
I have private regular doctor for primary care			
Vaccinated	47(48.0)	51(52.0)	0.899
Unvaccinated	88(43.3)	115(56.7)	
I visited my primary care provider in the last year			
Vaccinated	58(59.2)	40(40.8)	0.177
Unvaccinated	99(48.7)	104(51.2)	
I have been to hospital emergency department or been walked in clinic in the last year			
Vaccinated	77(78.6)	21(21.4)	0.342
Unvaccinated	135(66.5)	68(33.5)	

It is clear that the knowledge and attitude statements in the Likert scale responses showed to be significantly different in relation to gender, age, income, and health fitness ($p < 0.005$). On the other hand, the average of the total Yes/no and I have no Idea statement for the knowledge, attitude, and beliefs showed to be insignificantly different with all sociodemographic characteristics ($P > 0.05$).

3. DISCUSSION

Out of the 301 participants, a sum of 98 (32.56%) showed to be vaccinated with the pneumococcal

vaccine. The result is quite lower than that reported in a similar Canadian study that showed (58%) responsive vaccination [8]. This may be due to the differences in the study population or the decrease in vaccination awareness in our elderly and younger Saudi participants. There was a statistically significant difference between the participants' age groups showing that a vaccination rate of (10.72%) was among the 41-60 years of age group and started to decline with the advancement of age until it reached minimal with the age group of 71->80 years of age (2.07%). On the other hand, the younger adult of the 20-40 years of age showed the

highest rate of (12.45%). This is indicative that elderly participants are less concerned to get their vaccination compared to younger adults. These findings agreed with the National Immunization Coverage Survey (NICS) which found less than 40% of all the elderly Canadian population ≥ 65 years were vaccinated [9].

Although most of the participants had access to a health care provider yet, only (59.2%) of the total vaccinated and 48.7%) of the total unvaccinated had visited their primary care provider in the past year), the majority of the participants showed to have less opportunity from the providers to offer them the vaccine. Only 25% of both the vaccinated and the unvaccinated said that they have been offered the vaccine by their doctors and healthcare providers compared with the rest of the participants who didn't remember if their healthcare providers offered the pneumococcal vaccine at all. This could explain the low percentage of the rate of vaccination among the elderly and the younger adults in this study. It is therefore strongly believed that it is the responsibility of the healthcare provider to

routinely offer to vaccinate their patients especially the elderly who showed to be less responsive to be vaccinated. This conclusion is very true as up to (85.71%) of the participants agreed that their provider never believes that they should the pneumonia vaccine. Both the vaccinated and the unvaccinated participants were quite sure that Using vaccines are very important to prevent disease like pneumonia at a rate of (54.5%) The participants had quite positive responses on the statements of knowledge attitudes and beliefs regarding pneumococcal vaccination at a rate of (68.34), however they still short in responding to vaccination.

These findings dictate the need for essential roles to integrate healthcare providers in educating their patients about the risks of Influenza pneumococcal disease (IPD) on their health. Meta-analysis studies showed that many important factors including healthcare providers education and reminders as well as patients outreach and personal contact were essential in the improvement of the pneumococcal

Table 6. Pearson's correlation of participants sociodemographic characteristics and average knowledge, attitudes, beliefs and facilitation regarding Pneumonia vaccination

		ST 1	ST 2
Gender	Pearson Correlation	-.328**	.028
	Sig. (2-tailed)	.000	.627
	N	300	300
Age	Pearson Correlation	.398**	-.051
	Sig. (2-tailed)	.000	.381
	N	300	300
Education	Pearson Correlation	-.023	-.049
	Sig. (2-tailed)	.686	.399
	N	300	300
Income	Pearson Correlation	.162**	.009
	Sig. (2-tailed)	.005	.873
	N	300	300
Nationality	Pearson Correlation	-.035	-.008
	Sig. (2-tailed)	.543	.888
	N	300	300
Health fitness	Pearson Correlation	.125*	-.029
	Sig. (2-tailed)	.030	.616
	N	300	300
Vaccination	Pearson Correlation	.172**	.007
	Sig. (2-tailed)	0.003	.910
	N	300	300
ST_1	Pearson Correlation	1	.231**
	Sig. (2-tailed)		.000
	N	300	299
ST_2	Pearson Correlation	.231**	1
	Sig. (2-tailed)	.000	
	N	299	300

vaccination coverage among elderly and younger adults, however, the uncertainty of some healthcare providers about the effectiveness of the pneumococcal vaccines could be an explanation of the lack of vaccination and immunization [10].

Observational studies have found that the vaccine is associated with reduced risk of pneumococcal bacteremia, pneumococcal pneumonia and all-causes of community-acquired pneumonia [11]. however, a meta-analysis of clinical trials investigating the efficacy of the polysaccharide pneumococcal vaccine (PPS), which covers 23 pneumococcal serotypes in adults failed to find a protective effect [5].

Our findings showed that younger participants between the 20-40 years of age showed higher rates of vaccination than the older adults and the rates of vaccination showed to decline with age. This indicates that younger adults seem more enthusiastic to take the vaccination compared with the elderly. Our finding was inconsistent with that from Sweden (Christenson & Lundbergh, 2002), Spain (Sintes, et al, 2011), and United States (Ehresmann et al, 2001) showing that adults 70 years old and older were more enthusiastic to take the vaccine compared with the younger adults [12].

It appears in our study that the perception for vaccination showed to be significantly different from the participant's level of education ($p = 0.045$). This could be related to the probable enhancement in responsible thinking of weighing the benefit to the risk of the vaccine [12]. Educational programs may be therefore suggested to focus on the risk of the IPD especially among elderly individuals and the more severe outcomes of the infection due to their age if not used the vaccine [13].

The need to increase the awareness of elderly and younger adults must be initiated as it was found that the decline from being vaccinated has a direct association with the lack of knowledge about the vaccine [13]. Among the studied population, 68.44% said that they had not heard from their doctors and healthcare providers about the pneumococcal vaccine. The pneumococcal vaccine would likely be well-received when proper knowledge and recommendation are passed from the healthcare providers to their patients, however, other sources of

communication may also be as important [14]. The T-test statistics showed that the interrelation between the participants' sociodemographic characteristics and their knowledge, attitude and belief responses were highly significant indicating that personal characteristic is as important as healthcare provider's recommendation for the initiation of the use of the Pneumonia vaccine. The same results were reported by Amin HS et al. [15].

5. CONCLUSION

The knowledge, attitudes, and beliefs of adults and elderly outpatients regarding pneumococcal vaccination at the Taif hospital cluster were investigated. Elderly participants were more declined to perceive pneumococcal vaccination compared to younger adults. The participant's knowledge, attitudes, and beliefs were affected by their sociodemographic characteristics. Healthcare providers seem to be an essential key in providing their patients with the updated knowledge and recommendation to encourage them to accept the vaccine.

CONSENT

As per international standard or university standard, participant's written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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