Knowledge and Attitude towards Herpes Zoster Vaccination among Population in Abha, KSA

Mazahir Elhadi Abdallah Mohammed[1], Amna Hamid Imam Babeker[2], Dalia Ali Algarni[3], Fatima Elshikh Mohammed Elhadi[4]

[1] Department of Public Health, Applied Medical Sciences, University of King Khalid, Kingdom of Saudi Arabia (KSA). mzmohamed@kku.edu.sa

[2] Department of Basic Medical Science, Applied Medical Sciences, University of King Khalid, Kingdom of Saudi Arabia (KSA).ahemam@kku,edu,sa

[3]Students at King Khalid University, Department of Public Health, Applied Medical Sciences, University of King Khalid, Kingdom of Saudi Arabia (KSA)Daazs081@gmail.com.

[4] Department of Public Health, Health Science, University of Saudi Electronic, Kingdom of Saudi Arabia (KSA). Email f.elhadi@seu.edu.sa

Abstracts - Herpes Zoster (HZ) is an infection caused by the Varicella-Zoster Virus reactivation, resulting in pain and vesicular rash with a dermatomal distribution (1). This study aimed to assess knowledge and attitudes toward Herpes Zoster vaccination among the Population in Abha, Saudi Arabia. Methods: -A cross-sectional descriptive study was conducted among adults more than 15 years of age in Abha City, Saudi Arabia. The sample size was 384, and the sampling technique used was non-probability convenient sampling. The data was collected using an online questionnaire, and data were analyzed by using the statistical package for Social (SPSS), version 26. Results: -From the findings of this study, most of the participants (97.7%) were Saudi, more than one-half (60.4%) were females, and single (51.8%). Nearly one-half (47.1%) worked in the non-healthcare field, roughly one-third (32%) were between 21 – 30 years, Majority participants (80.2%) heard about HZ disease; from those participants, more than one-third (35.7%) of their source of information about shingles was the internet. The knowledge level was low in most participants (78.4%) and moderate in more than one-fifth (20.1%). The level of attitude was positive in more than two-thirds of the participants in the study (73.7%). Conclusion: -Most participants had a low level of knowledge and a positive attitude. Educational programs are essential for increasing awareness, and the mass media should be involved in disseminating information on the importance of vaccination against Herpes Zoster.

Keywords: Knowledge, Attitude, Herpes Zoster vaccination, Adults, Abha, KSA.

1. INTRODUCTION

The varicella-zoster virus, which also causes chickenpox, reactivates to cause herpes zoster HZ, usually referred to as shingles. When the rash is in the blister phase, a shingles patient can transmit the virus [2]. There are viral particles in the blister fluid. Usually, the face or trunk is affected. Direct touch with the rash or inhaling in airborne particles can also transmit the infection. The virus may lay dormant in the body after chickenpox recovery and reawaken at a later age to cause shingles [3]. It's unclear how common herpes zoster is in Saudi Arabia, but it's becoming more common everywhere, especially in older people—both the incidence and severity of the disease rise noticeably after the age of 50. For instance, the incidence of HZ increases in the United Kingdom (UK) for individuals over 85, rising from 7.1 per 1000 person-years among 60 to 64-year-olds to 12.2 per 1000 person-years. Compared to the male population, females are more likely to get HZ. Compromised immunity also raises the incidence [4]. Although shingles can strike anyone at any age, due to aging-related immune system changes, older persons are more susceptible to contracting it. It is noteworthy that individuals who have not received the vaccine or who have never had chickenpox may still contract the disease by coming into touch with a shingles carrier. A concerning sign of the growing strain on the country's healthcare services is the severity of HZ [5]. HZ often manifests as a vesicular dermatological rash that crusts in ten days and does not reach the body's midline. The rash's associated pain might vary greatly; sufferers may feel scorching, tingling, aching, or hypersensitivity. Ten to twenty percent of HZ patients older than fifty get post-herpetic neuralgia, or PHN [6].

The most typical warning signs and symptoms include headache, fever, sore throat, coughing, itching, and tingling in the area where the rash is going to appear. Severe side effects from Shingles might include post-herpetic neuralgia, blindness, and neurological issues [7]. It is still unclear how the Varicella-Zoster Virus (VZV) reactivates and the precise pathophysiology of the virus's latency in dorsal root ganglia and trigeminal neurons [8]. However, a number of risk factors for herpes zoster have been identified, including diabetes mellitus, malignancy, immunosuppression (solid organ transplant recipients, HIV, immunosuppressive medications), and stress [8]. It has been shown that as people age, their likelihood of contracting this illness has also increased noticeably, as has PHN. A concerning sign of the growing strain on the country's healthcare infrastructure is the severity of HZ [9]. Corticosteroids and antiviral medications have been used to treat HZ infections; however, research on pharmacological therapy for post-herpes virus (PHN) infection is ongoing. Since antiviral therapy and analgesics are the only treatments available, PHN is extremely resistant to treatment. Only a small number of medical specialties have demonstrated positive benefits on pain and life quality. Neuropathic pain may respond well to medications such as tricyclic antidepressants, opioids, and anticonvulsants. Positive results have also been seen when acupuncture, lotions containing chillies, and psychological assistance for pain management and depression are employed [10]. A secure and reliable method of preventing shingles and its sequelae is the herpes zoster vaccine. It is advised for people over 50 years of age, has the potential to lower illness incidence by over 50%, and is best taken in two doses for maximum protection. For those fifty years of age and older, the herpes zoster vaccine is free in Saudi Arabia [11]. The frequency and severity of HZ and PHN were decreased by giving two doses of the HZ vaccination. Additionally, the immunization benefited those with weakened immune systems or those who were sensitive [12)

Many studies on Knowledge, Attitude, and Practice towards Herpes Zoster vaccination have been conducted in many countries and found variations in the level of Knowledge and attitude toward Herpes Zoster vaccination and proved the effectiveness of the vaccine. A study by Turkistani et al. 2023 in Makkah, Saudi Arabia, found a good level of KAP about shingles and its vaccine. Many participants had previously heard about the shingles vaccine and knew that it was given to adults aged more than 50 years. [5]. A cross-sectional study done by Alhothali et al., 2023, in the Western Region, Saudi Arabia, among the general population, found that most participants had a good knowledge of HZ and its vaccine. Positive attitudes and poor practices toward the HZ vaccine were found (13). In the USA, a cross-sectional study was conducted by Baalbakiet al. (2019) in Detroit, MI, among participants aged ≥ 50. The study concluded that patients in underserved communities require targeted education about HZ and the new HZ vaccine recommendations (14). Another study was done by Vezzosi et al., 2017 in Italy among parents of children aged 4-7 years, which stated that few parents knew that the vaccine was available and the number of doses. The positive attitude towards the utility of the vaccination was found. More educational campaigns to disseminate knowledge about varicella among parents is need (15). Herpes Zoster (HZ) occurs more frequently with several complications and disability in older patients and negatively affects their quality of life. By studying knowledge and attitudes about Herpes Zoster (HZ) and its vaccine, we can significantly improve vaccine coverage. This, in turn, can lead to a reduction in the disease's severity in case of a breakthrough. Therefore, this study was conducted to assess knowledge and attitudes toward Herpes Zoster vaccination among the Population in Abha.

2. MATERIEL AND METHODS

The study was designed as a descriptive Cross-sectional study and conducted in Abha city, Asir region, KSA among adults more than 15 years of age. Non-probability sampling method, convenience sampling technique was used. Sample size was calculated using the online Raosoft sample size calculator software (16): The margin of error was (5) Confidence level was (95%) The population size was (3657). So, the recommended sample size was (384).

The data was collected using an updated online questionnaire from January 2024 to April 2024, which was taken from Turkistani et al. (2023) (5) and developed to collect data from the participants.

The questionnaire was divided into four main sections: -

Section 1: Socio-demographic and clinical data of Abha population in Saudi Arabia: - It included socio-demographic and clinical data of the subjects who participated in the study, and it contained (6) questions (Gender, age, nationality, marital status, education level, work field.

Section 2: For assessment of knowledge about Herpes Zoster disease among Abha population it contained (5) questions.

Section 3: - For assessment of knowledge of shingles vaccine among the participants in the study, it contained (6) questions.

Section 4: - For assessment of the participants' attitudes toward shingles, it contained (6) questions.

The collected Data was entered and analyzed using SPSS (Statistical Package for the Social Sciences (Version 26)). The knowledge, a score of"1" for the correct answer, and"0" for incorrect answer. The score of knowledge about shingles was classified as follows: Low (0-4); moderate (5-8); and good (9-12). A scoring system was applied in which questions about attitudes toward shingles were measured using a 5-point Likert scale ranging from (1 = strongly disagree to 5 = strongly agree).

Then, the results were presented sequentially in tables to highlight the major findings; data was presented using descriptive statistics as frequencies and percentages. -

The study was approved from The Research Ethics Committee at King Khalid University (HAPO-06-B-001) an explanation of the study's purpose was provided, and informed consent was obtained before filling out the questionnaire. Study subjects' privacy and anonymity were maintained, along with the confidentiality of the collected data.

3. RESULTS AND DISCUSSIONS

The chronopotentiometric curves obtained for the 0.01 M NaCl at current densities of (0.605, 0.668, 0.732 ,0.796, 0.859, 0.923, 0.987 y 1.05 mA/cm2) are presented in Figure 6.

Sociodemographic data of the study subjects (n = 384).

The study sample showed that majority of the participants (97.7%) were Saudi, the majority (77.6%) were University graduates or higher, more than one-half (60.4%) were females, and single (51.8%). Nearly one-half (47.1%) worked in the non-healthcare field, and nearly one-third (32%) were between 21 – 30 years .This information presented in table (1)

Knowledge towards Herpes Zoster disease among participants (n = 384).

Most of the participants (80.2%) heard about HZ disease; from those participants, more than one-third (35%) of their source of information about shingles was the Internet. Nearly one-half of the participants chose the risk factors for HZ as immunodeficiency (46.9%) and age (45.6%). Regarding the people affected by HZ, nearly one-half (45.1%) responded to the elderly, and more than one-third (35.9%) chose all age groups. Regarding the signs, symptoms, and complications of HZ,more than two-thirds (70.3%) chose rash, nearly one-half (45.1%) fever, and more than one-thirdchose neuropathic pain and blisters (36.7% and 35.7%, respectively). . This information presented in table (2)

Knowledge towards shingles vaccine among participants (n = 384).

Among the participants in Abha, more than one-half (53.9%) answered that shingles vaccine can reduce the

incidence of disease by more than 50%, didn't know if shingles vaccine can treat active shingles (53.6%), didn't know if shingles vaccine is needed if the person already had chicken pox as a child (59.9%), and didn't know if shingles vaccine is no longer needed if the person already had shingles (56%). Nearly one-half (41.1%) answered that the shingles vaccine should be given to all age groups, and regarding the protection against shingles, less than one-fifth answered by getting vaccinated and by not hugging or shaking hands (19.3% and 19% respectively). This information presented in table (3)

Attitudes towards shingles vaccine among participants (n=384).

Majority of the participants (79.9%) agreed that they were interested in knowing more about this disease, agreed that they were interested in knowing about how to prevent it (84.7%), agreed that they would get the shingles vaccine if the doctor recommended it (76.6%), and more than two- thirds (70.3%) agreed that shingles had a significant effect on health. More than one-third (39.9%) agreed that they were worried about getting shingles and disagreed about worrying about the cost of the vaccine (33.6%). This information presented in table (4)

Table (1): Sociodemographic data of participants in Abha, KSA (n = 384).

Socio-demographic characteristics	Frequency	Percent
	No.	%
Gender		
Male Female	152	39.6
	232	60.4
Total	**384**	**100%**
Age		
15-20 years	83	21.6
21-30 years	123	32
31-40 years	45	11.7
41-50 years	98	25.5
More than 51 years old	35	9.1
Total	**384**	**100%**
Nationality		
Saudi	375	97.7
Non-Saudi	9	2.3
Total	**384**	**100%**
Marital status		
Single Married DivorcedWidow	199	51.8
	173	45.1
	8	2.1
	4	1.0
Total	**384**	**100%**
Educational level		
Can read and write Secondary school or lessUniversity or higher	13	3.4
	73	19.0
	298	77.6
Total	**384**	**100%**
Work field		
Not working / retiredNon-health care fieldHealth care field	157	40.9
	181	47.1
	46	12.0
Total	**384**	**100%**

Table (2): Knowledge towards Herpes Zoster disease among participants in Abha,KSA (n = 384).

Items	Frequency No.	Percent %
Have you ever heard about HZ disease?		
Yes	308	80.2
No	76	19.8
What is the source of your information about shingles?		
Doctor	9	2.9
Heard about it from someone	64	20.8
Know someone who had Herpes Zoster	93	30.2
Internet	110	35.7
Book	32	10.4
What do you think are risk factors for HZ? (Participant may choose more than one answer)		
Unhealthy diet	99	25.8
Chronic diseases	128	33.3
Age	175	45.6
Not getting enough sleep	41	10.7
Gender	26	6.8
Stress	114	29.7
Immunodeficiency	180	46.9
What groups of people does HZ affect?		
Children	5	1.3
Elderly	173	45.1
Males	16	4.2
Females	9	2.3
Immunocompromized	42	10.9
Pregnant women	1	0.3
All age groups	138	35.9
	384	**100%**
What are the signs, symptoms and complications of HZ? (Participant may choose more than oneanswer)		
Rash	270	70.3
Blisters	137	35.7
Cough	43	11.2
Fever	173	45.1
Sore throat	23	6.0
Neuropathic pain	141	36.7
Blindness	18	4.7

Table (3): Knowledge towards shingles vaccine among participants in Abha, KSA (n=384).

Items	Frequency No.	Percent %
Shingles vaccine can reduce the incidence of disease by more than 50%		
True	207	53.9
False	9	2.3
I don't know	168	43.8
Shingles vaccine can treat active shingles		
True	143	37.2
False	35	9.1

I don't know	206	53.6
Shingles vaccine is not needed if the person already had chicken pox as a child		
True	42	10.9
False	112	29.2
I don't know	230	59.9
Shingles vaccine is no longer needed if the person already had shingles		
True	72	18.8
False	97	25.3
I don't know	215	56.0
The shingles vaccine should be given to		
Infants (under 1year)	24	6.3
Children (1-18 years)	14	3.6
Adults (18-50 years)	84	21.9
Adults (more than 50 years)	104	27.1
All age groups	158	41.1
When you encounter someone infected with shingles, how do you protect yourself		
Wear a mask	28	7.3
Do not share food	19	4.9
Do not hug or shake hands	73	19.0
Do not use the same utensils	62	16.1
Take medications	4	1.0
Get vaccinated	74	19.3
Do nothing	124	32.3

Table (4): Attitudes towards shingles vaccine among participants in Abha, KSA (n=384).

Items	Frequency	Percent
	No.	**%**
I'm worried about getting shingles		
Strongly disagree	74	19.3%
Disagree	25	6.5%
Neutral	132	34.4%
Agree and strongly agree	153	39.9 %
Shingles has a significant effect on health		
Strongly disagree	23	6.0%
Disagree	17	4.4%
Neutral	74	19.3%
Agree and Strongly agree	270	70.3%
I am interested in knowing more about this disease		
Strongly disagree	20	5.2%
Disagree	6	1.6%
Neutral	51	13.3%

Agree and Strongly agree		
	307	79.9 %
I am interested in knowing about how to prevent it		
Strongly disagree	14	3.6%
Disagree	5	1.3%
Neutral	40	10.4%
Agree and Strongly agree		
	325	84.7 %
I would get the shingles vaccine if the doctor recommended it		
Strongly disagree	15	3.9%
Disagree	10	2.6%
Neutral	65	16.9%
Agree and Strongly agree		
	142	76.6 %
Total	**384**	**100%**

Figure (1) illustrates the level of knowledge score of participants regarding Herpes Zoster. A significant proportion of the participants (78.4%) demonstrated knowledge scores, while more than one-fifth (20.1%) had moderate knowledge scores.

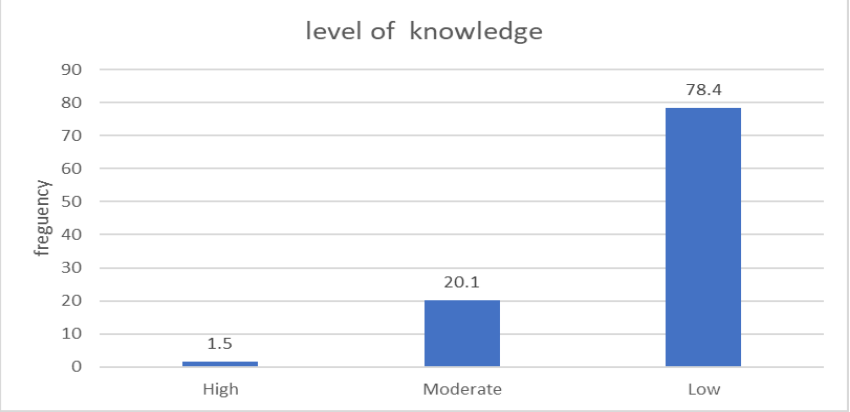

Figure (1) level of knowledge towards Herpes Zoster among the participants in Abha, KSA (n =384).

Figure (2) Shows a positive level score of attitudes in more than two thirds of the participants inthe study (73.7%) followed by the neutral (21%) and negative (4.4)

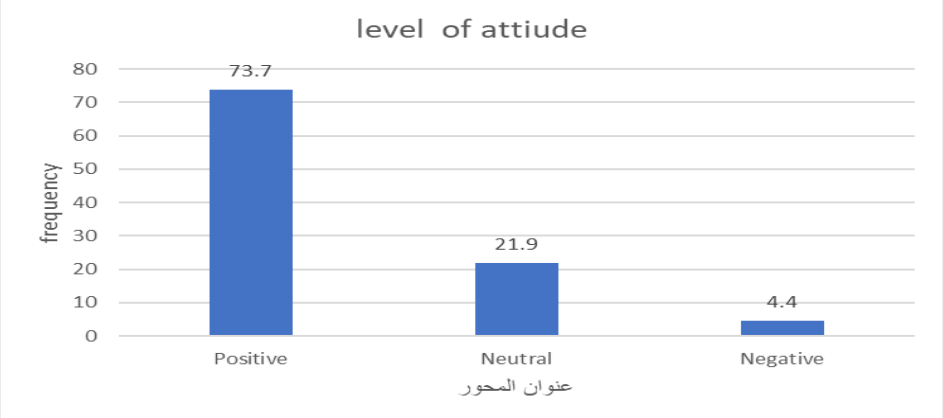

Figure (2) level of attitude towards Herpes Zoster among the participants in Abha, KSA (n =384).

4. DISCUSSIONS

Herpes Zoster (HZ) is an infection caused by the Varicella-Zoster Virus (VZV) reactivation, resulting in pain and a vesicular rash with a dermatomal distribution. This study assessed knowledge and attitude towards Herpes Zoster vaccination among the Population in Abha, KSA. The current findings revealed that most of the participants heard about HZ disease; from those participants, more than one-third of their source of information about shingles was the Internet. These results agreed with the study by Turkistani et al. in 2023, which found that the majority had previously heard about shingles. Less than two- thirds reported that the source of information was physicians, followed by a minority from the Internet [5]. According to Hu et al.'s 2017 study, which supports these findings, most participants had heard about Varicella, and information sources about Varicella were health care providers more than one-half [17]. These findings were consistent with a study by Baalbaki et al. 2019 which found that most participants knew HZ [14]. The current findings revealed that nearly one-half of the participants chose the risk factors for HZ as immunodeficiency and age. These results agreed with the study by Turkistani et al. in 2023, which found that risk factors for shingles were found to be immunodeficiency by most of the participants and age [5]. These findings were consistent with a study by Baalbaki et al. 2019 which found that more than two-thirds of the participants replied that adults aged ≥ 50 years had a higher risk of HZ [14]. These findings were consistent with a study by Lam et al., 2017 which found that the majority knew that an immunocompromized state was a well-known risk factor for HZ [4].

The current study showed that more than two-thirds replied that they were more likely to get shingles if they got chicken pox. These results agreed with those of Turkistani et al. in 2023, which found that less than two-thirds replied that if they got chicken pox, they were more likely to get shingles [5]. The current study showed that nearly one-half answered that they couldn't get HZ if they came into contact with somebody who had it. These results agreed with the study by Turkistani et al. in 2023, which found that more than one-half replied that they couldn't get HZ if they encountered somebody who had it [5]. These findings were consistent with a study by Lam et al., 2017 which found that more than two-thirds responded that contacts of HZ patients could not acquire HZ infection directly [18]. These results disagreed with the study conducted by Vezzosi et al., 2017 depicted that most participants answered that Varicella is an infectious disease. In contrast to this study finding, Hu et al.'s 2017 study documented that the majority answered that Varicella is an infectious disease. More than two-thirds responded that the transmission is mainly from person to person [17]. The current study documented that one-half of the participants answered that there is a cure for HZ. These results agreed with the study by Turkistani et al. in 2023, which found that more than two-thirds replied that there is a cure for HZ [5]. These findings were consistent with a study by Lam et al., 2017, which found that more than two- thirds of respondents replied that HZ was treatable [18].

Regarding the people affected by HZ, nearly one-half responded to older people, and more than one-third chose all age groups. These results agreed with the study by Turkistani et al. in 2023, which found that the majority of the participants responded elderly, and less than one-third chose all age groups [5]. These findings were inconsistent with a study by Lam et al., 2017 which found that more than two-thirds knew that HZ can reactivate at a young age [18]. Regarding HZ's signs, symptoms, and complications, more than two-thirds chose rash, nearly one-half of fever, and more than one-third chose neuropathic pain and blisters. These results agreed with the study by Turkistani et al. in 2023, which found that the majority of the participants chose rash and more than one-half fever. Regarding complications, the majority chose neuropathic pain and blisters [5]. These findings were consistent with a study by Lam et al., 2017 which found that most participants identified rash, blisters, and neuropathic pain as HZ's most commonly known symptoms [18]. In the present study, the level of knowledge about Herpes Zoster disease was low in the majority of the participants and moderate in more than one-fifth. These results disagreed with the study by Turkistani et al. in 2023, which found that a good level of knowledge about shingles among the study participants was found [5]. These findings were incongruent with Vezzosi et al., 2017 depicted that adequate knowledge was found among the study participants [15]. The study findings depicted that more than one-half answered that the shingles vaccine could reduce the incidence of disease by more than 50%. The study's findings matched with a study conducted by Lam et al., 2017 which found that more than two-thirds knew that the vaccine could significantly reduce infection incidence of HZ [18].

The study findings showed that more than one half of the participants didn't know if the shingles vaccine could treat active shingles. These findings matched those of a study conducted by Lam et al., 2017, which found that less than one-half knew that the vaccine is not indicated for treating active disease [18]. These results disagreed with Turkistani et al.'s 2023 study, which found that the majority of the participants replied that the shingles vaccine can treat active shingles [5]. The study findings documented that more than one-half of the participants didn't know if a shingles vaccine was needed if the person already had chicken pox as a child. These results disagreed with Turkistani et al.'s 2023 study, which found that less than two- thirds reported that the shingles vaccine is needed even if the patient had previously had chickenpox [5]. The study findings found that nearly one-half answered that the shingles vaccine should be given to all age groups. These results disagreed with Turkistani et al.'s 2023 study, which found that most participants responded that the shingles vaccine should be given to adults more than 50 years of age [5]. The study findings depicted that regarding the protection against shingles, less than one- fifth answered by getting vaccinated and not hugging or shaking hands. These results agreed with Turkistani et al.'s 2023 study, which found that more than one-half of the participants replied that protection was through getting vaccinated, not hugging or shaking hands [5]. The findings of the study showed that the majority of the participants agreed that they were interested in knowing more about this disease. These results agreed with the Turkistani et al. 2023 study, which found that more than one-third was highly likely to be interested in knowing more about the disease [5]. These results matched with Alhothali et al., 2023 found that most participants agreed they were interested in knowing the disease [13].

The study found that the majority of the participants agreed that they were interested in knowing how to prevent shingles. These results agreed with the study by Turkistani et al. 2023, which found that the majority of the participants agreed that they were interested in knowing how to prevent it [5]. These results agreed with Lam et al.'s 2017 study, which noted that almost two-thirds were interested in learning more about disease prevention [18].

The study's findings documented that majority participants agreed that they would get the shingles vaccine if the doctor recommended it. These results agreed with the Turkistani et al. 2023 study, which found that nearly one-half were highly likely to get the shingles vaccine if the doctor recommended it [5]. The study's findings showed that more than two-thirds agreed that shingles had a significant effect on health. These results agreed with the study by Turkistani et al. 2023, which found that nearly one-half thought it likely that shingles had a significant effect on health [5]. These results matched Lam et al.'s 2017 study, which noted that most believed that HZ could significantly affect their health [18]. The study's findings showed that more than one-third agreed they were worried about getting shingles. These results agreed with the Turkistani et al. 2023 study, which found that less than one-third agreed they were concerned about getting shingles [5]. These results aligned with Lam et al.'s 2017 study, which noted that more than one-third were worried about getting the disease [18]. These results were in contrast to Alhothali et al.,2023 found that almost one-quarter of participants disagreed that they were worried about getting shingles [13]. The study found that more than one-third disagreed about worrying about the cost of the vaccine. These results agreed with the study by Turkistani et al. 2023, which found that less than one-half disagreed about worrying about the cost of the vaccine [5]. These results matched Lam et al.'s 2017 study, which noted that less than one-third said they could afford the HZ vaccine [18] in contrast to the study findings of Alhothali et al., 2023 study which found that approximately one-third of the participants were concerned about the cost of the vaccine [13].

The present study showed that the level of attitude toward the HZ vaccine was positive in more than two-thirds of the participants. These results agreed with the Turkistani et al. 2023 study, which found a positive attitude among the study participants [5]. These results agreed with Hu et al., 2017, which found that the majority of participants had a positive attitude toward the HZ vaccine [40]. These results matched with Alhothali et al., 2023 found that most participants showed positive attitudes toward the HZ vaccine [13].

CONCLUSIONS

The study concluded that most participants had low knowledge of Herpes Zoster disease and its vaccine, and a positive attitude toward the vaccine. The study suggested raising the level of knowledge about Herpes Zoster and

its vaccines through health education programs and activating the role of mass media in increasing awareness among elderly patients and those who are immune compromised. Further research with a larger sample and a wide range is needed to measure the knowledge, attitude, and barriers regarding Herpes Zoster vaccination to prevent complications.

REFERENCES

[1] van Oorschot D, Vroling H, Bunge E, Diaz-Decaro J, Curran D, Yawn B.A systematic literature review of herpes zoster incidence worldwide. Hum Vaccines Immunother 2021; 17(6):1714–32.

[2] Yawn BP, Merrill DD, Martinez S, et al. Knowledge and Attitudes Concerning Herpes Zoster among People with COPD: An Interventional Survey Study.

[3] Vaccines 2022; 10 (420).

[4] AlMuammar S, Albogmi A, Alzahrani M, et al. Herpes zoster vaccine awareness and acceptance among adults in Saudi Arabia: a survey-based

[5] cross-sectional study.Tropical Diseases, Travel Medicine and Vaccines 2023; 9 (17).

[6] Cadogan SL, Mindell JS, BreuerJ, et al. Prevalence of and factors associated with herpes zoster in England: a cross-sectional analysis of the Health

[7] Survey for England.Infectious Diseases 2022; 22 (513).

[8] Turkistani SA, Althobaiti FJ, Alzahrani SH. The knowledge, attitude and practice among Makkah physicians towards Herpes Zoster Vaccination,

[9] Saudi Arabia, 2023.Cureus; 15 (11): pages:1-12.

[10]John AR, and Canaday DH. Herpes Zoster in the Older Adult. Infect Dis Clin NAm 2017; 811–826.

[11]Patil A, Goldust M, Wollina U. Herpes zoster: A Review of Clinical Manifestationsand Management. Viruses 2022, 14(192).

[12]Bongers LD, Navarini A, Berger CT, Mueller SM. Complications and cost estimations in herpes zoster - a retrospective analysis at a Swiss tertiary

[13]dermatologyclinic. Swiss Med Wkly. 2021; 151

[14]Singer D, Thompson-Leduc P, Ma S, et al. Burden of Herpes Zoster Among Patients with Psoriasis in the United States. Dermatol Ther (Heidelb)

[15]2023; 13:2649–2668.

[16]Jeon YH. Herpes Zoster and Post herpetic Neuralgia: Practical Consideration forPrevention and Treatment. Korean J Pain 2015; 28 (3): 177-184.

[17]Tricco AC, Zarin W, Cardoso R, Veroniki AA, Khan PA, Nincic V, Ghassemi M,Warren R, Sharpe JP, Page AV, et al. Efficacy, effectiveness, and safety

[18]of herpes zoster vaccines in adults aged 50 and older: systematic review and network meta- analysis. BMJ. 2018; 363.

[19]Ciabattini A, Nardini C, Santoro F, Garagnani P, Franceschi C, Medaglini D:Vaccination in the elderly: the challenge of immune changes with aging. Semin Immunol. 2018, 40:83-94.

[20]Alhothali OS, Alhothali AS, Hanif AA, et al. A Cross-Sectional Study of the Knowledge, Practice, and Attitude towards Herpes Zoster Vaccination among the General Population in the Western Region of Saudi Arabia. Cureus 2023, 15(1): e33508.

[21]Baalbaki NA, Fava JP, Ng M, et al. A Community-Based Survey to Assess Knowledge, Attitudes, Beliefs and Practices Regarding Herpes Zoster in an Urban Setting. Infect Dis Ther 2019; 8:687–694.

[22]Vezzosi et al. Knowledge, attitudes, and behaviors of parents towards varicella and its vaccination. BMC Infectious Diseases 2017; 17:172.

[23]http://www.raosoft.com/samplesize.html

[24]Hu et al. Knowledge, Attitude and Practice of Pregnant Women towards Varicella and Their Children's Varicella Vaccination: Evidence from Three Districts in Zhejiang Province, China. Int. J. Environ. Res. Public Health 2017; 14 (1110).

[25] Lam et al. A cross-sectional study of the knowledge, attitude, and practice of patients aged 50 years or above towards herpes zoster in an out-patient setting. Hong Kong Med J 2017; 23 (4): 365 – 373.

DOI: https://doi.org/10.15379/ijmst.v11i1.3841