



Research article

Health-seeking behaviors and determinants among herpes zoster patients in South Wollo public hospitals, Ethiopia, 2022

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ABSTRACT

Background: Health-seeking behavior towards herpes zoster is vital to find an appropriate remedy for patients and utilization of timely healthcare services can have an impact on good health outcomes. The study aimed to assess the health-seeking behavior and determinants among Herpes Zoster patients in public hospitals, South Wollo, Ethiopia.

Method: A hospital-based cross-sectional study was conducted from September 1, 2022, to November 30, 2022. The simple random sampling technique was used to select 419 participants. Pretested, structured questionnaires and patient interviews were used to collect the data. The bivariable analysis was done and variables with p-value <0.25 were further examined using a multivariable logistic regression model. AOR with a 95 % CI and a P-value <0.05 at a 5 % level of significance were considered.

Results: About 55.6 % of patients had poor health-seeking behavior towards herpes zoster, with a response rate of 99.1 %. Distance from health facilities (AOR = 4.9; 95 % CI: 1.33–10.35), being rural residence (AOR = 0.3; 95 % CI: 0.17–0.40), being illiterate (AOR = 5.9; 95 % CI: 3.40–10.32), poor self-care adherence (AOR = 1.8; 95 % CI = 1.14–3.07), moderate depression (AOR = 7.3; 95 % CI: 4.10–11.50), moderate (AOR = 0.3; 95 % CI: 0.10–0.70) and severe anxiety (AOR = 0.1; 95 % CI: 0.01–0.63), and duration more than seven days of herpes zoster (AOR = 3.1; 95 % CI = 1.42–6.97) were statistically significant.

Conclusion: Nearly half of the study participants had poor health-seeking behavior. Being a rural resident and illiterate, poor self-care adherence, moderate and severe anxiety, moderate depression, and duration of more than 7 days were significantly associated with health-seeking behavior towards Herpes Zoster. Proper guidance, psychological support, and awareness creation about Herpes Zoster severity and complications.

1. Introduction

Herpes zoster is a contagious, painful, and contagious neurocutaneous illness with prodromal symptoms, affecting individuals of various ages, genders, and digestive disorders. Antiviral therapy is a treatment option, but complications can result in higher healthcare costs and financial burdens [1–4]. Healthcare-seeking behavior involves individuals seeking appropriate remedies for health problems, impacting population health outcomes. It promotes well-being, recovery, and rehabilitation, regardless of health

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concerns and potential health issues [5,6].

Global HZ incidence rates have been reported to range from 3 to 5 cases per 1000 person-years, with 5.23–10.9 cases per 1000 person-years in people over 50 [1]. In the USA alone, it is estimated that approximately one million new cases of HZ are diagnosed each year, with the rate of incidence being significantly higher among individuals aged >50 years [2]. Annual rates of new HZ cases in North America, Europe, and Asia-Pacific have ranged from 3 to 5 cases per 1000 inhabitant-years, with little data available from Africa, Asia, and the Latin America and Caribbean (LAC) region [3]; the overall lifetime prevalence of shingles in England has been estimated to be 11.5 % [4]. In South Africa, the burden of herpes zoster among newly initiating HIV-infected patients is 2 % of patients experiencing the condition after ART initiation. Patients with low CD4 counts and those with prior episodes of herpes zoster were at higher risk for a diagnosis [5]. Herpes zoster prevalence ranges from 43 % in Uganda [6] to 61.7 % in Nigeria [7] to 47.6 % in Taiwan [8]. In Ethiopia, herpes zoster has been observed at levels as high as 63 % in the Wolaita Zone, 48 % in eastern Ethiopia, and 19.7 % in northern Ethiopia [9–11]. Antiviral therapy treatments are increasing HZ incidence, leading to ophthalmic, vascular, visceral, and neurological complications, increasing healthcare costs and financial burdens on patients [12].

According to the Gulf Cooperation Council (GCC) study evaluation, the prevalence of HZV ranged from 15.0 % to 92.2 % in Saudi Arabia, the United Arab Emirates (UAE), and Qatar [13]. Severe HZ infection burdens patients and healthcare systems, causing chronic diseases and affecting 30 % of the global population, with risk factors and chronic diseases contributing [14–16]. Healthcare-seeking behavior is a complex outcome due to different factors, including specific diseases or health conditions, and needs contextual exploration for each health condition [17]. A study by Addis Ababa University found that Ethiopians without formal education had lower health-seeking behavior compared to those with higher education in the Hossana region. [18]; a study conducted in India found that 29.17 % of participants had a low level of health-seeking behavior, which was linked with income and education level [19]. Globally, no earlier studies have been conducted. hence this study reveals a growing prevalence of herpes Zoster in Ethiopia, highlighting the need for health policymakers to reduce hospitalization burdens. The multicenter approach allows for general population conclusion and serves as a baseline for future research. Therefore, this study aimed to assess health-seeking behavior and determinants among herpes zoster patients in South Wollo public hospitals.

1.1. Conceptual framework

The conceptual framework was developed after reviewing the relevant literature [16,17,20,21]. (Fig. 1).

2. Materials and methods

2.1. Study settings and participants

The study was carried out in the South Wollo zone at five public hospitals, which are located around 500 km from Addis Ababa. This includes Dessie Specialized and Comprehensive Hospital (DCSH), located 400 km from Addis Ababa, with approximately 80 HZ patients. Boru Meda General Hospital (BMGH) is found in Dessie and has 65 HZ patients. There are 150 HZ patients at Akesta General

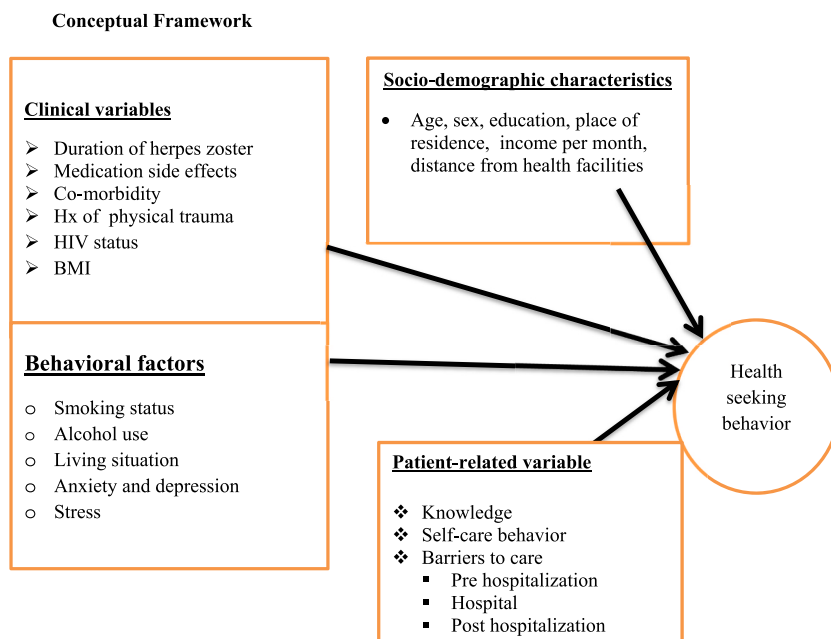


Fig. 1. The conceptual framework was developed after reviewing the relevant literature (2–7).

Hospital (AGH), 194 HZ patients at Amhara Sayint Primary Hospital (ASPH), and 101 HZ patients at Queen Zewditu Primary Hospital (QZPH). The five hospitals' 3-month patient flow was about 58,960. The study was conducted from September 1, 2022, to November 30, 2022 among patients with HZ.

2.2. Study design

A cross-sectional study design was employed.

2.3. Population

All adults with HZ patients who attended South Wollo public hospitals during the data collection period and fulfilled eligibility criteria were the study population.

2.4. Inclusion and Exclusion criteria

During the study period, all HZ patients over the age of ≥ 18 in South Wollo public hospitals were included, while those who were unable to communicate due to hearing or speaking difficulties were excluded.

2.5. Sample size determination

The sample size is determined for the first objective and was calculated using a single proportion formula with a 95 % confidence interval, a marginal error (d) of 5 %, and a prevalence (P) of 50 %, indicating that there is no comparable study in and around the country.

$$n = \left(\frac{Za^2}{2} \right) p (1 - p) / d^2$$

Based on the following assumptions-Where - Z= 1.96 with 95 % CI.

d = Degree of precision or margin of error (0.05)

P = Proportion (0.5)

$$n = \frac{(1.96)^2 0.5(1 - 0.5)}{(0.05)^2} = 384.16$$

By adding 10 % of the non-response rate, the sample size was $384.16 + 38.416 = 422.57 \approx 423$ (Fig. 2)

Schematic Diagram of the Sampling Technique

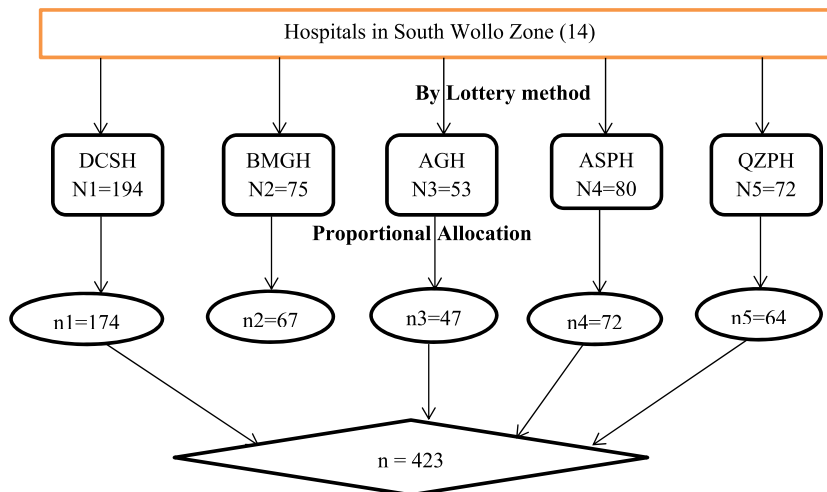


Fig. 2. Schematic Presentation of Sampling Procedure to Select Study Participants from Each Public Hospital in South Wollo, Ethiopia, 2022. Key: DSCH- Dessie Specialized and Referral Hospital, BMGH- Boru Meda General Hospital, AGH-Akesta General Hospital, ASPH- Amhara Sayint Primary Hospital; QZPH-Queen Zewditu Primary Hospital; N-Source population; and n- Sample size.

2.6. Study variables

2.6.1. Dependent variable

Health seeking behavior (Good/Poor)

2.6.2. Independent variables

Socio-demographic characteristics: Age, sex, education, place of residence, income per month, and distance from a health facility.

Clinical factors: Duration of Herpes Zoster, medication side effects, co-morbidity, BMI, history of physical trauma, and HIV status.

Patient-related variables: Knowledge, self-care behavior, and barriers to care (pre-hospital, in-hospital, and post-hospital barriers).

Behavioral factors: Living situation, smoking status, alcohol use, stress, anxiety, and depression.

2.7. Data collection tool and procedure

The data were collected by five trained diploma nurses and one supervisor. The data was collected from patient interviews and semi-structured questionnaires. It has four parts, including socio-demographic characteristics, clinical factors, patient-related variables, and behavioral factors. Six socio-demographic variables, eight clinically related factors, seven health-seeking behavior-related questions, eleven self-care adherence questions, eight knowledge-based behavioral factors, ten perceived stresses, and fourteen anxiety- and depression-related questions are included in the tools. Health-seeking behavior has four-point Likert-type items ranging from not at all to always are categorized as follows: A health-seeking behavior score of $\geq 70\%$ was considered good health-seeking behavior, and a score of $< 70\%$ was considered poor health-seeking behavior. Self-care adherence has five points Likert-type items ranging from strongly agree to strongly disagree are categorized as follows: A self-care adherence score of $\geq 75\%$ was considered to have good adherence and a score of $< 75\%$ was considered to have poor adherence. Knowledge was assessed using an eight-item knowledge scale. It contains eight yes-or-no type items, which are classified as follows: A score $\geq 75\%$ was categorized as having adequate knowledge, and a score of $< 75\%$ was categorized as having inadequate knowledge.

Stress was assessed through the perceived stress scale (PSS) [22]. It has ten items with five-point Likert-type ratings, and a score of 0–13 was considered mild, 14–26 was considered moderate, and 27–40 was considered severe.

Both anxiety and depression were assessed through the hospital anxiety and depression scales. It has 14 items with 4-point Likert-type questions: seven items for anxiety and seven items for depression, with a score of 0–7 considered normal, with 8–10 for mild, 11–14 for moderate, and 15–21 for severe [23].

Hospital consent letters were sent to each of the study participants, explaining the purpose, benefits, and risks of the research. The English questionnaires were translated into Amharic to collect the data. A code number was used to ensure the confidentiality of the participants rather than using their names.

2.8. Operational Definitions

Good health-seeking behavior: clients who scored 75 % and above on health-seeking behavior-related questions using Bloom's cutoff points [24–26].

Adequate knowledge: participants who scored $> 75\%$ on knowledge-related questions were considered to have adequate knowledge. where those who scored $< 75\%$ were considered to have inadequate knowledge using Bloom's cutoff points [24,27].

Co-morbidity: It refers to the presence of confirmed illnesses in the patient's chart in addition to herpes zoster, like diabetes, cardiovascular disease, kidney disease, malignancy, COPD, rheumatoid arthritis, systemic lupus erythematosus, and inflammatory bowel disease.

Good self-care adherence: Participants scored $> 75\%$ for self-care adherence-related questions.

Anxiety and Depression: A HADS score of 0–7 is considered normal, 8–10 mild, 11–14 moderate, and 15–21 severe [23,25].

Stress: In this study, PSS scores from 0 to 13 were considered mild, scores from 14 to 26 were considered moderate, and scores from 27 to 40 were considered to have severe stress [22].

Body Mass Index (BMI): participants less than < 18.5 were considered underweight, between 18.5 and 29.9 were considered normal, and ≥ 30 were considered obese or overweight [28].

Alcohol use: In this study, it refers to any use of alcohol in the past 30 days [29].

Smoking has been an active act of cigarette use by the study participant for the last month [30].

2.9. Data analysis

The data was entered using Kobo Toolbox version 2022.1.2 and exported to SPSS version 26. Both bivariable and multivariable logistic regression were used to identify associated factors at a 95 % confidence interval. After bivariable analysis, all independent variables with a p-value ≤ 0.25 were transferred to multivariable logistic regression, and the variable with a P-value < 0.05 was declared statistically significant. Assumptions for a binary logistic regression model's goodness-of-fit were checked with the Hosmer-Lemeshow test (0.087), and multicollinearity tests were checked by VIF(4.9), and there was no value showing multicollinearity.

2.10. Data quality Assurance

To maintain the validity of the data collection tool, the questionnaire was translated into the local language. The questionnaire was pretested on 43 (10 %) of the nurses at Kombolcha General Hospital a week days before the final study. The content validity of the tool was checked by two experts in the field. The training was given to the supervisor and data collectors regarding the Kobo toolbox, ethical issues, tools, objectives, and sampling techniques and procedures.

A tool for determining health-seeking behavior (4 Likert scale 7 questions), self-care adherence (5 Likert scale 11 questions), knowledge (3 Likert scale 8 questions), perceived stress (5 Likert scale 10 questions), hospital anxiety (4 Likert scale 7 questions), and depression (4 Likert scale 7 questions). Tool reliability was checked using Cronbach's alpha tests. The pretest values of Cronbach's alpha tests were self-care adherence (0.78), knowledge (0.89), HSB (0.76), anxiety (0.76), depression (0.78), and PSS (0.85), whereas the posttest values were self-care adherence (0.85), knowledge (0.91), HSB (0.84), anxiety (0.83), depression (0.86), and PSS (0.89).

3. Results

3.1. Socio-demographic characteristics of study participants

From 423 respondents 419 completed the study with a 99.1 % response rate. Of the respondents, 312 (74.5 %) were the age of above 45 or more years. Two hundred twenty-eight (55.4 %) were females, 192 (45.8 %) were unable to read and write, 259 (61.6 %) participants were rural residents, 165 (38.6 %) of the study participants were more than 4 km away from health facilities and the majority 238 (56.8 %) of the respondents had the monthly income of >2500 ETB (Table 1).

3.2. Clinical conditions and related attributes

About 299 (71.4 %) of participants had more than 7 days or more duration with HZ. About 15 (3.6 %) of participants had a history of physical trauma. Among the respondents, 26 (6.2 %) had positive HIV status. About 94 (22.4 %) participants were comorbid with HZ. Diabetes was the major 41 (9.8 %) comorbidity. About 11 (2.6 %) participants had two or more comorbid problems. 82 (19.6 %) of participants were underweight with BMI scoring (Table 2).

3.3. Behavioral factors

Among the total study participants, the majority 386 (92.1 %) were living with someone. Only 46 (11 %) participants had a smoking habit and 26 (6.2 %) participants smoked 1 to 3 packets per week. About 82 (19.6 %) participants consumed alcohol. About 93 (22.2 %) and 52 (12.4 %) of participants had mild and moderate anxiety levels respectively. Whereas about 41 (9.8 %), 27 (6.4 %), and 6 (1.4 %) of participants had mild, moderate, and severe depression respectively. About 188 (44.9 %) of participants had perceived a moderate level of stress (Table 3).

3.4. Self-care adherence

The study revealed that nearly half (51.8 %) of respondents had poor adherence to self-care behavior for the treatment of herpes zoster (Fig. 3).

Table 1

Socio-demographic characteristics of the patients with herpes zoster attending in South Wollo public hospitals, Ethiopia, 2022 (N = 419).

Variables	Category	Frequency (n)	Percentage (%)
Age	19–34	47	11.2
	35–44	60	14.3
	≥45	312	74.5
Sex	Male	191	45.6
	Female	228	54.4
Educational status	Unable to read and write	192	45.8
	Can read and write	88	21.0
	Primary school	70	16.7
	High school	31	7.4
Place of residence	College and above	38	9.1
	Urban	161	38.4
	Rural	258	61.6
Distance to H/facility	<1 Km	76	17.8
	1- 4 Km	115	26.9
	>4 Km	165	38.6
	I Do not know	63	14.7
Average monthly income (ETB)	<2500 ETB	181	43.2
	≥2500 ETB	238	56.8

ETB (Ethiopian Birr).

Table 2

Clinical Factors of Patients with Herpes Zoster patients in South Wollo Public Hospitals, Ethiopia, 2022 (N = 419).

Variable	Category	Frequency (n)	Percentage (%)
Duration of Herpes Zoster	≤3days	61	14.6
	4–7 days	62	14.8
	≥7 days	296	71.6
Do you have any history of physical trauma?	No	404	96.4
	Yes	15	3.6
HIV status	Negative	382	91.2
	Positive	26	6.2
	Status unknown	11	2.6
Do you take medication as it is prescribed?	Yes	328	78.3
	No	91	21.7
Is there any side effect you experienced after starting the medication	Yes	314	74.9
	No	105	25.1
If yes, have you stopped taking medication?	Yes	131	21.3
	No	182	43.4
Comorbidity	Yes	94	22.4
	No	325	77.6
Types of comorbidity	DM	41	9.8
	CVD	5	1.2
	Renal disease	27	6.4
	Malignancy	10	2.4
	Rheumatoid arthritis	9	2.1
	SLE	5	1.2
	COPD	9	2.1
	No comorbidity	325	77.6
Number of comorbid problems other than herpes zoster	One	83	19.8
	≥Two	11	2.6
	Normal	318	75.9
BMI	Underweight	82	19.6
	Obese/overweight	19	4.5

BMI (Body Mass Index); DM (Diabetes Mellitus); CVD(Cardio-Vascular Disease); SLE (Systemic Lupus Erythematus); COPD (Chronic Obstructive Pulmonary Disease).

Table 3

Behavioral factors of herpes zoster patients attending in South Wollo public hospitals 2022 (N = 419).

Variable	Category	Frequency (n)	Percentage (%)
Living situation	Living with someone	386	92.1
	Living alone	33	7.9
Smoking	Yes	46	11.0
	No	363	89.0
Number of cigarettes packs /week (n = 43)	<1 packet	12	2.9
	1-3 packet	26	6.2
	>3 packet	05	1.2
Alcohol	Yes	82	19.6
	No	337	80.4
Anxiety	Normal	263	62.8
	Mild	93	22.2
	Moderate	52	12.4
	Severe	11	2.6
Depression	Normal	345	82.3
	Mild	41	9.8
	Moderate	27	6.4
	Severe	6	1.4
Perceived stress	Mild	230	54.9
	Moderate	188	44.9
	Severe	1	0.2

3.5. Knowledge

Regarding knowledge towards Herpes Zoster 189 (45.1 %) of study participants had inadequate knowledge about herpes zoster (Fig. 4).

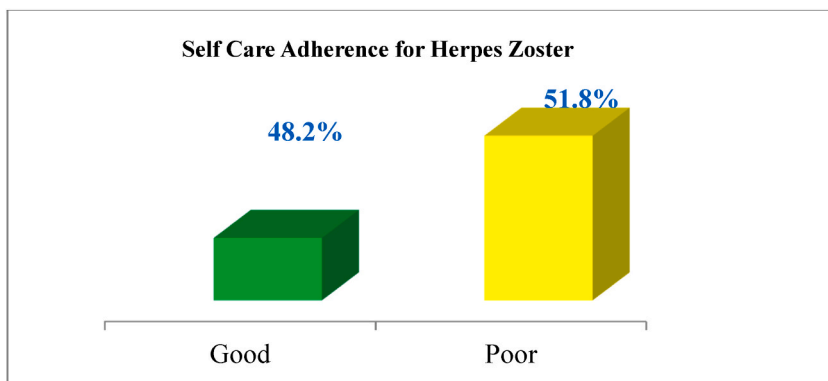


Fig. 3. The adherence to self-care adherence for the treatment among herpes zoster patients in South Wollo selected public hospitals, Ethiopia, 2022 (N = 419).

3.6. Barrier to care

Out of 419 study participants the majority of respondents reported 322 (76.8 %), 144 (34.4 %), and 122 (29.8 %) were trouble finding or affording transportation, did not think symptoms were serious, and responsibilities at home or work respectively. Whereas hospital barriers, insufficient treatment or counseling 259 (61.8 %), cost of testing and treatment 221 (52.7 %), and uncaring, rude, or lazy staff 39 (9.3 %). In addition, post-hospital barriers include intolerable medication side effects 281 (67.1 %) and finding/affording transportation 191 (45.6 %) (Table 4).

3.7. Health Care Seeking Behaviors of respondents

Among the study participants, 233 (55.6 %, 95 % CI: 51.2,58.7) had poor health-seeking behavior toward herpes zoster (Fig. 5).

3.8. Factors associated with health-seeking behavior

To know the association of predictor variables with health-seeking behavior, both bivariate and multivariable analyses were done. Bivariable logistic regression analysis was performed to identify variables associated with the health-seeking behavior of herpes zoster and variables with a p-value <0.25 were entered into multivariable logistic regression. In bivariable logistic regression sex, distance from health facilities, place of residence, educational status, self-care adherence, level of depression and anxiety, duration of herpes zoster, body mass index, knowledge of participants, and the number of comorbidities other than HZ were variables associated with health-seeking behavior towards herpes zoster. In a multivariable logistic regression analysis, distance from health facilities, residence, education status, self-care adherence, depression, anxiety, knowledge, and duration of herpes zoster were variables associated with health-seeking behavior towards herpes zoster at p-value <0.05.

Participants who lived >4 km from health facilities were 4.9 times more likely to have good health-seeking behavior than participants who lived <1 km from health facilities (AOR = 4.9; 95 % CI: 1.33–10.35; P-0.017). Participants who lived in rural areas were 70 % less likely to have good health-seeking behavior than those who lived in urban areas (AOR = 0.3; 95 % CI: 0.17–0.40; P-0.001).

Illiterate participants were 5.9 times more likely to have poor health-seeking behavior than literate (AOR = 5.9; 95 % CI: 3.40–10.32; P - 0.001). Study participants who had poor self-care adherence were 1.8 times more likely to have poor health-seeking

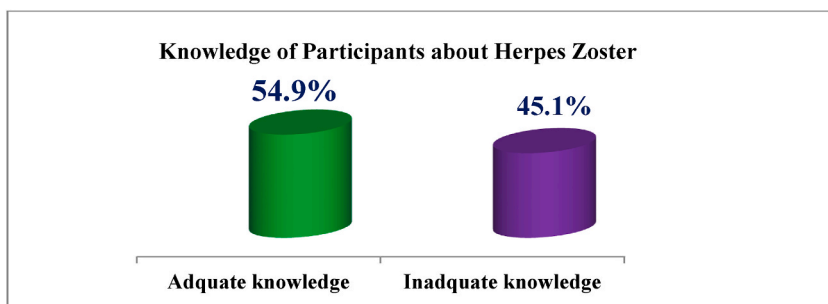


Fig. 4. Knowledge Status of Herpes Zoster Patients Attending in South Wollo Selected Public Hospitals 2022 (N=419) Knowledge

Regarding knowledge towards Herpes Zoster 189 (45.1 %) of study participants had inadequate knowledge about herpes zoster (Fig. 4).

Table 4
Barriers of herpes zoster patients attending in South Wollo public hospitals 2022 (N = 419).

Variables	Category	Response	Frequency (n)	Percentage (%)
Pre-hospital barriers	Responsibilities at home or work	No	293	69.9
		Yes	125	29.8
	Trouble finding or affording transportation	No	95	22.7
		Yes	322	76.8
	Did not think symptoms were serious	No	273	65.2
		Yes	144	34.4
	Concerns about the cost of care	No	327	78.0
		Yes	90	21.5
	Other*	No	392	93.6
		Yes	25	6.0
Hospital barriers	Long wait times	No	135	32.2
		Yes	281	67.1
	Uncaring, rude, or lazy staff	No	377	90.0
		Yes	39	9.3
	Insufficient treatment or counseling	No	157	37.5
		Yes	259	61.8
	Cost of testing and treatment	No	195	46.5
		Yes	221	52.7
	Other**	No	392	93.6
		Yes	24	5.7
Post-hospital barriers	Cost of follow-up care	No	201	48.0
		Yes	214	51.1
	Intolerable medication side effects	No	134	32.0
		Yes	281	67.1
	Finding/affording transportation	No	224	53.5
		Yes	191	45.6
Other***	No	403	96.2	
	Yes	12	2.9	

Other*(fear of stigma, not enrolled in the health insurance scheme, traditional treatment, and shortage of medication), other** (poor staff counseling, dissatisfaction, poor quality of care), other*** (lack of supporter, fear of stigma).

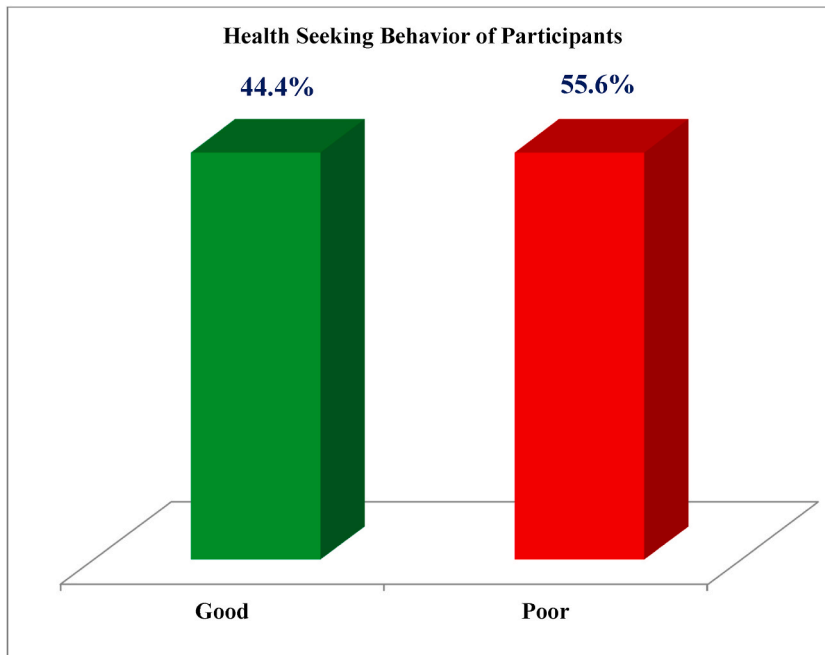


Fig. 5. The health-seeking behavior of adult and elderly Herpes Zoster patients on follow-up in South Wollo selected public Hospitals, Ethiopia, 2022 (n = 455)

Health Care Seeking Behaviors of Respondents
Among the study participants 233 (55.6 %) had poor health seeking behavior towards herpes zoster (Fig. 5).

behavior than those who had good self-care adherence (AOR = 1.8; 95 % CI = 1.14–3.07; P = 0.013). Study participants who had moderate depression were 7.3 times more likely to have good health-seeking behavior than those who had no depression (AOR = 7.3; 95 % CI: 4.10–11.50; P=0.02). Study participants who had moderate anxiety were 70 % less likely to have good health-seeking behavior than those without anxiety (AOR = 0.3; 95 % CI: 0.10–0.70; P=0.001), whereas severe anxiety was 90 % (AOR = 0.1; 95 % CI: 0.01–0.63; P=0.024). Study participants who had more than 7 days of HZ were 3.1 times more likely to have good health-seeking behavior than those who had <3 days duration of HZ (AOR = 3.1; 95 % CI = 1.42–6.97; P=0.001) (Table 5).

4. Discussion

The goal of the study was to assess the health-seeking behavior and determinants among Herpes Zoster patients. Although HZ is one of the main threats to world health, no studies have been done on the issue; this study could serve as a benchmark for research perspectives. A study from South Africa revealed that half of the participants self-reported health-seeking behaviors using various medicines for side-effect treatment, with most using prescribed medications from doctors and pharmacy personnel [31]. A study from Kenya revealed that health-seeking behaviors are strongly associated with low cost, and location of the service [32]. Good health-seeking behavior is an action carried out by any patients who perceive themselves to have herpes zoster for finding appropriate therapeutic interventions, nevertheless, in this study, more than half (55.6 %) of participants had poor health-seeking behavior based on the score of health-seeking behavior. The importance of health-seeking behaviors on herpes zoster guides healthcare providers and health organizations to enhance the health-seeking behaviors of the participants [33].

The place of residence, educational level, self-care adherence, level of depression and anxiety, and duration of herpes zoster were associated with increased odds of HZ. The England study shows that Age, gender, ethnicity, and digestive disorders may be risk factors for herpes zoster among adults with HIV [4]. This study found that HZ patients who lived in rural areas were significantly more likely to seek good health than those who lived in urban areas. This is inconsistent with the study conducted in India [21]. This might be due to differences in health insurance schemes, socioeconomic prominence, and procedures concerned with health-seeking approaches.

In this study, the illiterate participants were significantly more associated with poor health-seeking behavior (HSB) than those who were literate. This is inconsistent with patients with less literacy seeking HZ health care in Atlanta [21], and knowledge about herpes zoster was positively correlated with educational attainment associated with the Hong Kong study [34]. The possible reason could be due to the difference in the level of fear and anxiety towards the severity, duration, and intensity of the HZ and its complications. The improvement in knowledge might have a positive effect on their health-seeking behavior at the earliest.

The HZ patients with poor self-care adherence were significantly associated with good health-seeking behavior. This could be because of fear, anxiety, depression, or a lack of awareness about HZ. In contrast, clinical trials attempt to capture all cases of HZ in California [35], even mild cases for which the subject may not otherwise seek health care. Differences in HZ determination between clinical trials and studies using healthcare data could lead to different estimates of the effects of interventions such as vaccines.

Moderate depression was significantly more associated with good health-seeking behavior than those who had no depression. This result is consistent with the study conducted in Georgia [36], Denmark [37], and the UK [38]. HZ patients with moderate to severe anxiety were found to be more health-seeking than those with no anxiety. The results are in line with the study conducted in the US [39], Denmark [37], and the UK [38]. Anxiety and psychological symptoms may contribute to a decrease in immunity, acting as both a cause and a result of herpes zoster.

This study also discovered that participants who had more than 7 days of HZ were significantly more likely to have good health-seeking behavior than those who had < less than 3 days of duration with HZ. The possible reason could be due to the increased intensity of the diseases and aggravated symptoms, resulting in unbearable pain. Another plausible reason could be to reduce and prevent the recurrence of the episode and obtain better health care support.

4.1. Implications for practices

Poor health-seeking behavior for herpes zoster has serious health repercussions for the patient because, in most cases, untreated herpes zoster infection can cause physical, physiological, social, and psychological disturbances as well as postherpetic neuralgia. The quality of care provided to patients with herpes zoster will be improved by nurses' understanding of the factors that influence health-seeking behavior, such as inadequate knowledge, living in a rural area and being illiterate, poor self-care adherence, moderate to severe anxiety, moderate depression, and HZ duration of more than 7 days.

4.2. Strengths of the study

The multicentered study, one of the first in the country, serves as a crucial framework for further research and provides a solid foundation for conclusions.

4.3. Limitations of the study

The cross-sectional study design hinders the establishment of cause-and-effect relationships, necessitating further exploration of potential risk factors and mechanisms through longitudinal studies by incorporating depression and anxiety scales. Since there might also be discrepancies in the accurate measurement of depression and anxiety.

Table 5
Bivariable and multivariable analysis for associated factors with health seeking behavior of herpes zoster patients in South Wollo hospitals (N = 419).

Variables	Category	HSB		COR (95 %)	AOR (95 %)	P- value	
		Good	Poor				
Sex	Male	78	113	1.3 (0.88–1.92)	0.9 (0.56–1.51)	0.791	
	Female	108	120	1	1		
Distance from health facility	<1 Km	63	102	1	1	0.071	
	1-4 Km	119	111	3.1 (1.0–9.45)	3.4 (0.90–12.78)		
	≥4 km	04	20	5.4 (1.8–9.32)	4.9 (1.33–10.35)		0.017*
Residence	Rural	37	124	0.2 (0.14–0.34)	0.3 (0.17–0.40)	0.001**	
	Urban	149	101	1	1		
Educational Status	Illiterate	36	122	4.6 (2.93–7.15)	5.9 (3.40–10.32)	0.001**	
	Literates	150	111	1	1		
Self-care adherence	Good	101	92	1	1	0.013*	
	Poor	85	141	1.8 (1.23–2.69)	1.8 (1.14–3.07)		
Depression	Normal	140	205	1	1	0.159	
	Mild	22	19	1.7 (0.90–3.25)	0.6 (0.32–1.20)		
	Moderate	19	08	3.5 (1.48–8.17)	7.3 (4.10–11.5)		0.02*
	Severe	05	01	7.3 (0.80–10.30)	3.6 (2.24–12.94)		0.355
Anxiety	Normal	139	124	1	1	0.159	
	Mild	35	58	0.5 (0.33–0.87)	0.6 (0.32–1.20)		
	Moderate	11	41	0.2 (0.12–0.49)	0.3 (0.10–0.70)		0.001**
	Severe	01	10	0.1 (0.01–0.70)	0.03 (0.01–0.63)		0.024*
Duration of HZ	≤3days	17	43	1	1	0.812	
	4–7 days	10	50	0.5 (0.21–1.22)	0.9 (0.30–2.55)		
	>7 days	159	140	2.9 (1.57–5.26)	3.1 (1.42–6.97)		0.001**
Knowledge	Adequate	93	137	1	1	0.055	
	Inadequate	93	96	0.7 (0.48–1.03)	1.78 (1.01–3.11)		
BMI	Normal	138	180	1	1	0.593	
	Underweight	38	44	0.9 (0.55–1.45)	1.5 (0.35–6.28)		
	Obese/Overweight	10	09	1.3 (0.47–3.49)	0.9 (0.23–3.19)		0.8
Number of comorbidities other than HZ	No comorbidity	144	181	1.1 (0.65–1.72)	1.3 (0.69–2.43)	0.421	
	One comorbidity	38	45	0.7 (0.21–2.50)	0.5 (0.11–2.19)		0.356
	≥ Two comorbidities	4	7	1	1		

HSB (Health Seeking Behavior), HZ (Herpes Zoster), BMI (Body Mass Index), COR (Crude Odds Ratio), AOR (Adjusted Odds Ratio), * (P < 0.05), ** (P ≤ 0.001).

4.4. Conclusions

Over half of the study participants exhibit poor health-seeking behavior, with factors such as inadequate knowledge, rural residency, poor self-care adherence, anxiety, depression, and prolonged HZ duration being significant.

Declaration

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Ethical consideration

The ethical clearance was obtained (Ethical Number: RCSPG/1538/2022) from the ethical review committee of the research office of the College of Medicine and Health Sciences, Wollo University. Formal permission was obtained from the concerned officials of the selected hospitals. Written informed consent was taken from the study participant and confidentiality and anonymity were maintained.

Data availability statement

The data that support the findings of this study are available on request from the corresponding author's email greenwater3020@gmail.com. The data are not publicly available due to privacy/ethical restrictions. The containing information that could compromise the privacy of research participants. The data associated with this study has been deposited into a publicly available repository.

CRedit authorship contribution statement

Wondwossen Yimam: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Kumar Prem:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources,

Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Samuel Anteneh:** Writing – review & editing, Writing – original draft, Visualization, Supervision, Resources, Project administration, Methodology, Conceptualization. **Hawa Wolie:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Resources, Project administration, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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