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SELF-CARE PRACTICE AND ASSOCIATED FACTORS AMONG ADULT ASTHMATIC PATIENTS ON FOLLOW UP-CARE AT PUBLIC HOSPITALS IN EAST WALLAGA ZONE, WEST ETHIOPIA, 2024

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Abstract

Background: Self-care practice is an activity that an individual initiates and performs daily, on their behalf in maintaining life, healthful functioning, continuing personal development, and wellbeing. Despite there is the availability of self-care management recommendations, the implementation of self-care practice was not well studied in the world, particularly in developing countries including Ethiopia.

Objectives: The aim of this study was to assess self-care practice and associated factors among adult asthmatic patients on follow-up care at the public hospitals in East Wallaga zone, West Ethiopia, 2024

Methods: An institutional-based cross-sectional study design was conducted to assess 413 asthmatic patients on follow-up care at the public hospitals in East Wallaga zone, West Ethiopia from May 29 to July 29, 2023. The study participants were selected using a systemic random sampling technique. Data were collected through an interviewer-administered technique. Subsequently, the collected data were entered into Epidata version 4.6 and exported to SPSS version 27 for analysis. Associations between independent and dependent variables were assessed using binary logistic regression**.** Multivariable logistic regression analysis used an adjusted odds ratio (AOR) with a 95% confidence interval to identify factors associated with asthma self-care practices**.** Variables with a p-value< 0.05 were considered statistically significant

Results: A total of 413 study participants were included in the study. The results revealed that about 51.6% of the study participants had good self-care practices. Factors like no comorbidities (AOR: 2.0, 95% CI: 1.26-3.10), absence of alcohol consumption (AOR: 4.33, 95% CI: 2.52-7.44), non-smoking (AOR: 6.67, 95% CI: 2.46 -18.1) and social support (AOR: 1.57, 95% CI: 1.00-2.48) were significantly associated with good self-care practices among asthmatic patients.

Conclusion and recommendation: The study showed that slightly more than half of asthmatic patients had good self-care practices. The absence of comorbidities, never drinking alcohol or smoking, and having good social support were positively associated with good self-care practices. Therefore, healthcare providers should create health education programs for asthmatic patients

Strengths and limitations of this study

- The present study was conducted at large scale and multicenter study in East wollega hospitals
- Asthma self-care practice was self-reported data on asthma that might increase or decrease self-care practice
- This study was used cross-sectional to compare cause and effect relationship between asthma self-care practice and associated factors

Introduction

Asthma is a heterogeneous disease usually characterized by chronic inflammation of the airways. It is defined by early respiratory symptoms such as wheezing, dyspnea, chest tightness, and cough that vary in time, intensity, and variable expiratory airflow limitation(1). About 300 million people worldwide currently suffer from asthma, the number of people with asthma is projected to increase by about 100 million by 2025, and about 250,000 deaths from asthma have been reported worldwide, and more than 30 million people in the United States have been diagnosed with asthma during their lifetime (2). In Africa like, Congo appear to have high rates of asthma prevalence 6.9%(3)

In Ethiopia, asthma is one of the most common public health problems, causing mortality and morbidity from respiratory diseases(4). Its prevalence has increased in recent decades due to various contributing factors such as smoking, occupational hazards, presence of pests in the household, economic status of the household, residence of patients, and family history of asthma(5)

Self-care practice(SCP) is an action or activities that an individual's with asthma are performing and initiating on daily basis to maintain health, promote health, prevent disease, managing the symptom and coping with chronic illness with or without health care support (6). Asthma self-care practice is a strategy to control asthma symptoms and reduce future exacerbations but is poorly implemented in clinical settings due to patient, family, professional, and organizational factors(7). Asthma self-care practices that are inadequate pose a serious public health problem, that increasing morbidity and mortality in both developed and developing nations(8). Patients' ignorance, misinformation, or lack of understanding about asthma self-care is the main cause of the worldwide challenge in handling asthma(9)

Study conducted in Iraq, USA, and Saudi Arabia revealed that asthmatic patients attending hospitals exhibit low self-care practice about disease characteristics, reducing triggering factors, information provided by health profession, and behavioral factors(10-12). Similarly, study conducted in Northern part of Ethiopia, high percentages (57.3%) of asthmatic patients attending governmental public hospitals demonstrate poor self-care practice which contributes to the increasing economic expense of poorly controlled asthma disease , also asthma can significantly affect activity of daily life and lead to physical, emotional and social limitations, thereby impairing quality of life (13)

In Ethiopia, the impact of poor self-care practice among adult asthmatic patients were frequent hospitals visits, and admission to wards, as well as emotional, physical and affecting activities of daily life of patients. The reasons for poor implements in clinical settings include patients,

professionals, and organizational factors , specifically older age, co-morbid illness, anxiety, lack of social support, and alcohol consumption have been identified as significant contributing factors(13). The government of Ethiopia has decentralized Non-Communicable Diseases (NCDs) management including asthma, by training nurses at hospital level and health centers on who to visit and manage the patients prior to working in clinic setting(14). Implementation of this policy is very important in prevention of asthma complications, management and developing positive attitude in asthma self-care practice(13).

Despite there are the availability of self-care management recommendations, but its implementation of self-care practice was not well studied. Therefore, the study aimed to assess self-care practice and associated factors among asthmatic patients on follow-up care in public hospitals of East Wallaga, West Ethiopia.

Methods

Study design, study setting, and period

An institutional based cross-sectional study was employed. The study was conducted among asthmatic patients who attended at public hospitals in East Wallaga, Ethiopia from May 29 to July 29, 2023. The East wallaga zone composed of five hospitals such as Wallaga University referral hospital, Nekemte Comprehensive specialized hospital, Gida Ayana general hospital, Arjo primary hospital and Sire primary hospital. The Wallaga University referral hospital, and Nekemte Comprehensive specialized hospital are found in Nekemte city which is a capital town of East wallaga zone, Gida Ayana general hospital is found in Northern part of Nekemte town, Arjo primary hospital is found in West part of Nekemte town and Sire primary hospital is found Southern part of Nekemte town. In those hospitals there are around 903 asthmatic patients receiving follow-up care from which 234 patients were at Wallaga University referral hospital (234), 241 at Nekemte Comprehensive specialized hospital, 258 at Gida Ayana general hospital ,95 at Arjo primary hospital, and 75 at Sire primary hospital.

Source and study population

All adult asthmatic patients receiving follow-up care at public hospitals in East Wallaga zone were taken as the source population and patients who had follow-up care in the selected hospitals during the data collection period were considered as the study population.

Inclusion and Exclusion Criteria

Adult asthmatic patients who visited at the public hospitals in East Wallaga zone and had been receiving follow up care at least for six months prior to the data collection period was included

in the study, and asthmatic patients who have mental problem and unable to communicate verbally were excluded from the study.

Sample size and sampling procedure

The sample size was calculated using the single population proportion formula through the Epi Info Stat Calc program with the assumption of; a 95% level of confidence, 5% margin of error, and 42.3 % proportion(p) of good asthma self-care practice from previous study conducted in Northern part of Ethiopia, Amhara region(13) n=$z^2\frac{\mathrm{P}\,(1-\mathrm{P})}{d2}$. Taking these assumptions, the estimated sample size was 375. Adding 10% of the non-response rate the final total sample size was calculated to be 413. The calculated sample was proportionally allocated to each hospital based on the previous three month's patient flow to outpatient department among asthmatic cases. Then, a systematic random sampling technique was used to select the study participants. To do this first; the total number of asthmatic patients who had attended the follow-up clinic in the previous 3months for each hospital used as a sampling frame .Total number of asthmatic patients have follow-up care in clinic in the previous three months at five Public hospitals were 903. Then, listed the study participants on registration number and coded them. And sampling interval was calculated which was approximately two (2) for each hospital. Second; from this list of cards, the first participant involved was selected by using lottery method. Finally, every two intervals patient was interviewed (Fig 1)

Dependent variable

Self- care practice of asthmatic patients

Independent variables

Socio-demographic characteristic: age, sex, marital status, occupation, residence, education, income**; behavioral and psychosocial related factors:** history of cigarette smoking, history of alcohol consumption, physical exercise, social support, depression and anxiety, Knowledge about asthma self-care practice, attitude towards asthma**; clinical related factors:** history of comorbidity, exacerbation factors**,** history of hospital admission**,** duration of treatment**,** age diagnosed for asthma**,** presence of exacerbation in past 12 months**,** family history of asthma

Operational definitions

Self-care practices refers to actions or tasks that people take on their own behalf to promote self-care and lessen asthma attacks by using eight items and 32 scores (15)

Good self-care practice is when participants who scored above or equal to the mean of self-care practice questionnaire are considered as good asthma self-care practice, and poor self-care

practice is when participants who scored below the mean self-care practice questionnaire are considered as poor asthma self-care practice(9)

Comorbidity is any chronic disease the patient has together with asthma for he/she is taking medications(16)

Good knowledge is when participants who scored greater than or equal to the mean of knowledge-related questions are categorized as having good knowledge, and poor knowledge is when participants who scored below the mean of knowledge-related questions are considered as having poor knowledge(17)

Social support is when participants who scored above or equal to the mean from multidimensional social support questions were referred to as having social support and those who scored below the mean considered as having no social support (18)

Anxiety and depression is when participants who scored between 0–7, 8-10 and 11–21 are taken as having normal, borderline, and abnormal among anxiety and depression question respectively (19)

Positive attitude is when participants who scored above or equal to the mean from attitude related question and negative attitude is when participants who scored above or equal to the mean from attitude related questions(20)

Data Collection tool and procedure

Data was collected by face-to-face interviews using a structured questionnaire which was adopted from relevant literature and standardized questionnaires to assess asthma self-care practices and associated factors among adult asthmatic patients receiving follow-up care (9, 17-19, 21). The questions were prepared in English and then translated to Afaan Oromo by experts who are fluent in both languages and back-translated to English to check for any consistencies. The tools had four main parts. **Part one**: Socio-demographic variables which included age, sex, marital status, residence, ethnicity, educational status, and occupational status were assessed. **Part two**: Clinical related factors which included age at which patients were diagnosed for asthma, presence of other comorbidity, triggering factors, history of hospital admission, duration of asthma treatment, presence of exacerbating factors in past 12 months, family history of asthma, and duration of illness were assessed. **Part three**: Knowledge, psychosocial, attitude and behavioral factors which used to assess the following items. Social support was measured by using the Multidimensional Scale of Perceived Social Support(18). The multidimensional scale of the perceived social support tool consisted of twelve items. For each item, participants rated on a five-point scale from one to five, 1 =very strongly disagree, 2=strongly disagree, 3= Neutral, 4= strongly agree, 5= Very strongly agree.

The total score ranges from 12 - 60 which was calculated by summing up the scores for each item. Participants who scored above or equal to the mean from multidimensional social support questions were referred to as having social support and those who scored below the mean considered as having no social support(9). Anxiety and depression were measured by using the Hospital Anxiety and Depression Scale (HADS)(9, 19). The HADS consisted of fourteen items. Participants who scored between 0–7, 8–10, and 11–21 were taken as having normal, borderline, and higher levels of anxiety and depression respectively. The knowledge of asthma self-care practice was measured by using the knowledge of asthma self-care questionnaire (KASQ>50) calculated from summing the total score ranged from 0 – 16 (17). All questionnaires had alternatives from A - E. For respondent who correctly got answer (1) score and incorrect answer (0) score. Participants who scored greater than or equal to the mean of knowledge-related questions were categorized as having good knowledge and those who scored below the mean were considered as having poor knowledge. The attitude of asthmatic questionnaire was consisted of five items composed of 5 levels of attitude ranged from 1 to 5; 5=strongly agree, 4= agree, 3= Neutral, 2= disagree, and 1= strongly disagree(9). Participants with a score greater than mean out of attitude related questions were refereed to have a positive attitude, while those with a score less than mean were regarded to have a negative attitude (20).

Part four: Asthmatic self-care practice. The asthmatic self-care practice questionnaire was consisted of eight items. For each item, participants rated their self-care practice on a four-point Likert scale ranged from 1 to 4; 4= always perform, 3= frequent perform, 2= sometimes perform, and 1= never perform. The total score ranges from eight to thirty-two and is calculated by summing the scores for each item.

Participants who scored above or equal to the mean were considered as good asthma self-care practice whereas below the mean were taken as a poor asthma self-care practice(9, 13). The tool was validated tool and the pretest was conducted to evaluate the clarity of the tool before the actual date of the data collection period.

Data collection procedures

Data was collected by 5 BSc nurses and supervised by 2 BSc nurses who were trained about asthma self-care practice and associated factors among adult patients on follow-up care and who were working in clinical area. Patient who attends asthmatic clinic and fulfill the inclusion criteria was approached to participating in the data collection procedure. Data collectors were supervised by principal investigator and 2 BSc nurse supervisors.

Data quality control

A pretest was conducted among 5% (21) of the sample size at Shambu general Hospital in Horro Guduru Wallaga. During the pretest, the questionnaire was checked for its clarity, simplicity, understandability, consistence, coherency, and applicability of the instruments.

A reliability test (Cronbach's alpha) was performed to check the internal consistence with 82% for asthmatic self-care practice, 91% for social support, 73% for anxiety and depression, 72% for knowledge of asthma self-care management, and 92% for attitude of asthma self-care practice. One-day training was given for both the data collectors and supervisors before the actual data collection on the contents of the questionnaires and how to maintain confidentiality and privacy of the study subjects, and techniques of approaching the participants. Every day after data collections, questionnaires were reviewed and checked for completeness, accuracy, and clarity by principal investigator and supervisor.

Data processing and Analysis

The data were coded, checked for completeness, cleaned, and entered into Epi-data version 4.6, then exported to SPSS version 27 for analysis. Descriptive statistics were used to describe the variables. The results of the descriptive statistics were summarized in terms of frequency, tables, percentages, mean with standard deviation, median with interquartile range, and range. The outcome variable was dichotomized into good and poor based on the analyzed mean scores.

Binary logistic regression was done to see the associated between the outcome variable and each of explanatory variables. Those independent variables that have p-value < 0.25 were selected to become a candidate for multivariable logistic regression analysis. Again after doing multivariable logistic regression, the statistical significance of associations between variables was determined using odds ratios with 95% confidence interval (CI) and p-value < 0.05 was considered statistically significant. Backward LR method was used to identify the independent predictors of asthmatic self-care. Hosmer's and Lemishow goodness of fit test was used to test the model fitness which was 0.887. Also, multicollinearity was checked by using tolerance and Variance Inflation Factor (VIF). Since there was no severe multicollinearity between independent variables; the result of VIF were between (1.074 - 1.237), and tolerance (0.802 - 0.932) (Annex I)

Ethical Consideration

Ethical clearance and official letter was obtained from the Research and Ethics Committee of Institute of Health Science Wollega University to the selected public health hospitals. Formal letter was written for respective hospitals. Again permission was obtained from respective hospitals. After explaining the purpose and possible benefit of the study, written consent was

obtained from each participant before starting data collection. Study participants were informed of their right to refuse or discontinue participation at any time and ask any question during the data collection process. The confidentiality of patients was kept throughout the study. For the purpose of confidentiality, the names and any personal identifiers of the participants had not been recorded but code number had used.

Results

Socio-demographic characteristics of the study participants

A total of 413 participants were included in the study, resulting in a 100% response rate. The median age of participants was 44 years with inter quartile range (IQR) of 35-57 years. One hundred eight-two (44.1%) of the study participants were in the range of 35-54 years. Among the study participants, 220(53.3%) were male. Majority of participants, 239(57.9%) were married. Nearly more than half of study respondents 219(53%) were protestant followers. Regarding ethnicity, most of participants, 370(89.6%) were belongs to Oromo ethnic group. While 241(58.4%) resided in urban areas. Regarding educational status, about 124(30%) was unable to read and write. One hundred twenty-one (29.3%) of the respondents were farmers. The median average monthly income of household was 900 ETB (IQR) of 400-2650 ETB (Table 1).

Table 1 : Socio demographic characteristics of adult asthmatic patients at public hospitals in East Wallaga zone receiving follow-up care OPD, Western Ethiopia, 2023 (n=413)

Variables	Categories	Frequency	Percent
Sex	Male	220	53.3
	Female	193	46.7
Age groups(years)	18-34	100	24.2
	35-54	182	44.1
	≥55	131	37.1
Marital status	Single	100	24.2
	Married	239	57.9
	Divorced	40	9.7
	Widowed	34	8.2
Religion	Orthodox	135	32.7
	Muslim	59	14.3
	Protestant	219	53
Ethnicity	Oromo	370	89.6
	Amhara	29	7
	Others*	14	3.4

Residence	Urban	241	58.4
	Rural	172	41.6
Educational status	Unable to read & write	124	30
	Primary school	89	21.5
	Secondary school	111	26.9
	College and above	89	21.5
Occupational status	Student	58	17
	Daily labor	65	15.7
	Farmer	121	29.3
	House wife	58	14
	Merchant	56	13.6
	Civil servant	55	13.3
Average monthly income (ETB)	≤1000	242	58.6
	1001-2000	56	13.6
	2001-3000	23	5.6
	3001-4000	20	4.8
	≥4001	72	17.4

Clinical characteristic of the study participants

Concerning clinical characteristic of the study participants, nearly half of the study participants, 198(47.9%) were approximately, diagnosed with asthma between the ages of 25-49 years. About 136 (32.9%) participants had asthma illness for duration of 2-5 years. Additionally, about 170(41.2%) participants had a family history of asthma. Among study participants, about 161 (39%) had co-morbid illness of which 53(12.8%) had hypertension. Around three fourth of study participants, 286(69.2%) had a history of frequent asthma exacerbation with in last year. Less than half of study participants, 151(36.6%) had been admitted in the hospital in the last 12 months, from this 42(27.8%) was admitted to hospital by the cause of asthma. Furthermore, majority of the study participants, 350(84.7%) had triggering factor to seasonal variations (Table 2).

Knowledge, attitude, behavior, and psychosocial characteristics of the study participants

One hundred-twelve (27.1%) of participants were ever consumed alcohol, among them 57(50.9%) of participants were currently consuming alcohol. Fifty-four (12.1 %) of participants were ever cigarette smoker, thirty-one (57.4%) were currently smoking cigarette at greater than eleven stick per day, and 348(84.5%) had regular physical exercise.

Among the study participants; half of them 207 (50.1%) had no social support, and about 78.7% and 54.7% of study participants had anxiety and depression respectively. From the study participants; 155(37.5%) had poor knowledge about asthma self-care practice. Additionally,

less than half, 147(35.6%) of study participants had negative attitude about asthma self-care practice (Table 3).

Table 2: Clinical characteristics of adult asthmatic patients at public hospitals in East Wallaga zone receiving follow up OPD, West Ethiopia,2023 (n=413)

Variables	Categories	Frequency	Percent
Age at asthma diagnosis (year)	<25	166	40.2
	25-49	198	47.9
	≥50	49	11.9
Duration living with asthma (year)	<2	73	17.7
	2-5	136	32.9
	6-10	105	25.4
	11-20	70	16.9
	>20	29	7.0
Family history of asthma	Yes	170	41.2
	No	243	58.8
History of co-morbidity	Yes	161	39.0
	No	252	61.0
Types of co-morbidity	Heart failure	25	15.5
	Diabetes mellitus	29	18
	Renal disease	33	20.5
	Hypertension	53	33
	Others**	21	13
History of asthma exacerbation in the last 12 months	Yes	286	69.2
	No	127	30.8
History of admission to hospital in last 12 months	Yes	151	36.6
	No	262	63.4
If yes, cause of admission	Asthma	42	27.8
	Others***	109	72.2
Triggering factors can exacerbate asthma attack	Yes	350	84.7
	No	63	15.3

Table 3: Knowledge, psychology, attitude and behavioral characteristics of adult asthmatic patients at public hospitals in East Wallaga zone receiving follow up care OPD, West Ethiopia,2023(n=413)

Variables	Categories	Frequency	Percent
Are you ever drinker alcohol	Yes	112	27.1
	No	301	72.9
Are you currently drinking alcohol	Yes	57	50.9
	No	55	49.1
If yes, how many times a week	<2	20	35
	≥2	37	65
Are you ever smoker	Yes	54	13.1
	No	359	86.9
Are you currently cigarette smoke	Yes	31	57.4
	No	23	42.6
If yes, how many cigarettes do you smoke per day	<5	7	22.6
	5-10	6	19.4
	≥11	18	58
Have you doing regular physical exercise	Yes	349	84.5
	No	64	15.5
If yes, which physical exercise do you practice	Walking	316	90.6
	Gymnastic	13	3.7
	Running	20	5.7
Duration of doing physical exercise per day (in minute)	<30 minutes	193	46.7
	≥ 30 minutes	156	37.8
Social support	Have social support	206	49.9
	No social support	207	50.1
Anxiety	Normal	12	2.9
	Borderline	76	18.4

	Abnormal	325	78.7
Depression	Normal	97	23.5
	Borderline	90	21.8
	Abnormal	226	54.7
Knowledge	Poor knowledge	155	37.5
	Good knowledge	258	62.5
Attitude	Negative attitude	147	35.6
	Positive attitude	266	64.4

Proportion of asthma self-care practice

Among the 413 study participants, 213(51.6%) had asthma good self-care practice with 95% CI (46.7, 56.4) (Fig.1)

Factors associated with self-care practice

Bivariable logistic regression was used to identify an association between each independent variables and the outcome variable (asthma self-care practice). Those variables which showed an association at p value < 0.25 variables were entered into the multivariable logistic regression model. In the binary logistic regression analysis residence, co-morbidity, family history of asthma, history of asthma exacerbation, seasonal variations, pests, ever alcohol consumption, ever smoking cigarrete, social support, depression, and attitude were variables candidate for multivariable with having a p-value < 0.25. In the multivariable logistic regression analysis; co-morbidity, ever smoked cigarrete, ever alcohol consumed, and social support were found to be significant predictors of self-care practice of asthmatic patients.

The absence of co-morbidity was found to have a significant association with good self-care practice. Participants without any co-morbidity had higher odds of good self-care practice as compared to those with co-morbidity (AOR: 2.0, 95% CI: 1.26-3.10).

There was a significant association between never consuming alcohol and self-care practice. Participants who reported never consuming alcohol had higher odds of good self-care practice as compared to those who had ever consumed alcohol (AOR: 4.33, 95% CI: 2.52-7.44). Participants who reported never smoking had significantly association with good self-care practice as compared to those who ever smoked. The odds of good self-care practice were lower among individuals who reported ever smoking (AOR: 6.67, 95% CI: 2.46-18.1)

Participants who reported having social support showed a significant association with good self-care practice. Participants with social support had higher odds of good self-care practice as compared to those without social support (AOR: 1.57, 95% CI: 1.00-2.48). (Table 4)

Discussion

This study was aimed to assess the magnitude of good self-care practice and associated factors among adult asthmatic patients on the follow-up care at public hospitals in East Wollega zone, West Ethiopia. Accordingly, nearly half of (51.6%) the study participants revealed to have a good asthma self-care practice in the study area. The finding of this study is in line with a study conducted in Bangladesh (9) and Taiwan (22) in which good asthma self-care practice was found to be 49.63% and 51.5% respectively. On the contrary, this finding is lower than the study conducted in Saudi Arabia 57.1%(12). In Saudi Arabia, this discrepancy might be due to the differences of health-related information received, study design (mixed method), and availability of resource and

Table 4 : Bivariable and multivariable logistic regression analysis for factors associated with good self-care practice among patients with asthmatic receiving follow up-care OPD at public hospitals in East wallaga zone, West Ethiopia, 2023(n=413)

Variables	Categories	Self-care practice		COR 95% CI	p-value	AOR 95% CI	p-value
		Good	Poor				
Residence	Urban	131	110	1.30(0.88-1.93)	0.18	1.02(0.64-1.62)	0.93
	Rural	82	90	1		1	
Family history of asthma	Yes	91	79	1			
	No	109	134	1.42(0.96-2.10)	0.08	1.24(0.79-1.95)	0.35
Co-morbidity	Yes	99	62	1		1	
	No	101	151	2.39(1.59-3.58)	0.01	**2(1.26-3.10)***	0.03
History of asthma	Yes	147	139	1			
	No	53	74	1.48(0.97-2.25)	0.07	1.10(0.67-1.83)	0.70
Seasonal variations	Yes	176	174	1			
	No	24	39	1.64(.95-2.85)	0.08	1.56(0.83-2.93)	0.17
Pests	Yes	98	88	1			
	No	102	125	1.37(0.93-2.01)	0.12	1.26(0.79-2.00)	0.32
Ever Alcohol drank	Yes	88	24	1		1	
	No	112	189	6.19(3.72-10.29)	0.01	**4.33(2.52-7.44)***	0.01
Ever Smoked	Yes	49	5	1		1	
	No	150	208	13.59(5.25-34.69)	0.01	**6.67(2.46-18.1)***	0.01
Social support	Have social support	124	82	2.56(1.72-3.80)	0.01	**1.57(1.00-2.48)***	0.04
	No social Support	77	130	1		1	
Depression	Normal	51	46	1.06(0.47-1.22)	0.25	1.06().57-1.77)	0.99
	Borderline	46	44	1.25(0.49-1.31)	0.37	0.79(0.45-1.40)	0.43
	Abnormal	103	123	1			
Attitude	Positive	122	144	0.75(1.24-1.99)	0.16	1.04(0.64-1.69)	0.87
	Negative	78	69	1		1	

health facilities, health education programs improved patient's knowledge about self-care , less sample size (125), life style modification, and socio-demographic characteristics of study participants on asthma self-care practice. Also, this finding was higher than the studies conducted in the Northern part of Ethiopia 42.3% (13), and Rwanda 33.8% (15). In Northern part of Ethiopia, this discrepancy might be due to the socio-demographic characteristics of study participants (30.2% had no formal education), they didn't assess patient's attitudes toward asthma self-care practice, small number of study settings (only on 3 hospitals), study participants had poor knowledge of asthma self-care practice (41.5%), and socio-cultural practice of the study participants (75.5% habit of alcohol consumption). In Rwanda, discrepancy might be due to the behavioral factors (45.5% habit of alcohol consumption), study period, small sample size, and number of study setting were only on 1 hospital and 3 health centers. Additionally, knowledge of study participants and patient's attitude towards asthma self-care practice in current study is high when compared with study conducted in northern part of Ethiopia and Rwanda

Asthmatic patients who had social support were 1.57 times more likely to have good asthma self-care practice as compared to those who had no social support. This finding suggest that having social support may increase self-care which leading to good self-care pracice. This result was similar with the study conducted in Northern part of Ethiopia, which showed that asthmatic patients who had no social support were nearly two times more likely to have poor self-care practices as compared to those who had social support(13). Another study conducted in US; also support this finding, which showed that social support from families and friends are important for persons with chronic illness such as asthmatics to develop a positive self-concept and self-esteem to give emotional and social support for the implementation of self-care practice particularly in medication adherence and accompying the patient to health facilites on the date of appoitment (21, 22)

Asthmatic patients who had no co-morbidity illness were 2 times more likely to have good asthma self-care practices when compared to those patients who have comorbid illness. This suggests that having co-morbidities increases the likelihood of poor self-care practice among the participants. This result was in line with the study conducted in Northern part of Ethiopia, asthmatic cases who had a co-morbid illness were nearly two times more likely to have poor selfcare practices as compared to those participants who have no comorbid illness(13). Co-morbidities illness worsen the conditions of the patient and make them unable to adhere to

selfcare practice, complicate the diagnosis and management system which can lead to misdiagnosis and under treatment or over treatment(23)

The asthmatic patients who didn't smoke cigarettes were 6.67 times more likely to have good asthma self-care practices when compared to those asthmatic patients who did smoke cigarettes. This suggests that a history of smoking is associated with an increased likelihood of engaging in poor self-care practices. Cigarette smoking will destroy the lung and alveolus, particularly for those who smoke more than 11 cigarettes per day, which appears to be an important triggering factor for the asthmatic response to worsen(24).

Another study found in Taiwan supports this finding: patients with no smoking history who quit smoking have better self-care practices than those who continue to smoking (22).

Cigarette smoking has been associated with an accelerated decline in lung function, increased health service use, and increase severity in patients with asthma, providing insight of patients on how to cessation smoking improves lung function among adult asthmatic patients. However, as a result, asthmatic patients who smoke cigarettes might have poor self-care practices(25). The asthmatic patients who did not consume alcohol were 4.33 times more likely to have good self-care practices when compared to those asthmatic patients who consume alcohol. This indicates that individuals who have a history of alcohol consumption are more likely to exhibit poor self-care practices. This finding was similar to the study conducted in the northern part of Ethiopia which showed that asthmatic patients who consumed alcohol were nearly two times more likely to develop poor self-care practices when compared to those who had not consume alcohol(13). Drinking alcohol, especially wine, appeared to be an important trigger for the asthmatic response that worsens, and causes alcohol-induced asthma, which causes pathological bronchoconstriction that affects many patients with asthma(26).

Also consumptions of alcohol can damage the lungs and induce asthma exacerbations; as a result, asthmatic patients who drink alcohol might forget to take their medicines and exhibit reduced self-care practices(15)

Conclusion and Recommendations

The study indicates that slightly more than half of the asthmatic patients in the study area demonstrated good self-care practice. This signifies that a considerable proportion of asthmatic patients may not be fully engaging in the recommended self-care practice. The study also concluded that not having comorbid illnesses, never drinking alchol, being non-smoker, and having good social support were significantly associated with good self-care practices of asthmatic patients in the study area. Therefore, health care providers should act to increase

knowledge and attitude of asthmatic patients who receiving follow up-care at public hospitals by disseminating tailored information on factors associated aggravate asthma exacerbations

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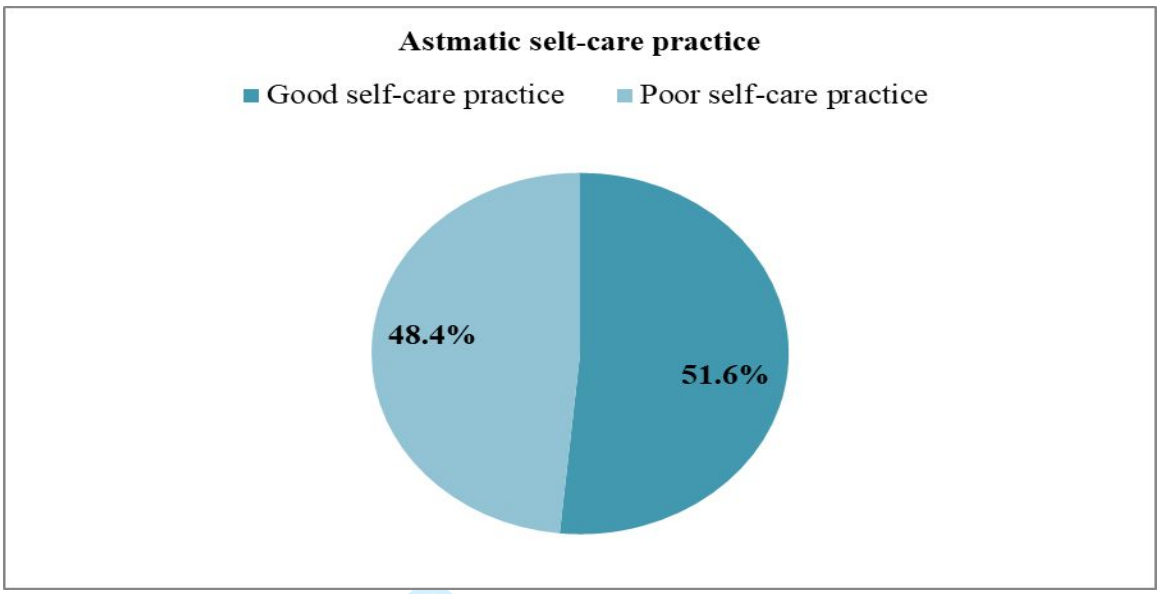

Figure 1. self-care practices of adult asthmatic patients at public hospitals in East Wallaga zone receiving follow up care OPD, West Ethiopia,2023

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SELF-CARE PRACTICE AND ASSOCIATED FACTORS AMONG ADULT ASTHMATIC PATIENTS ON FOLLOW UP-CARE AT PUBLIC HOSPITALS IN EAST WOLLEGA ZONE, WEST ETHIOPIA, 2023

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SELF-CARE PRACTICE AND ASSOCIATED FACTORS AMONG ADULT ASTHMATIC PATIENTS ON FOLLOW UP-CARE AT PUBLIC HOSPITALS IN EAST WOLLEGA ZONE, WEST ETHIOPIA, 2023

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Abstract

Background: Asthma self-care is a set of actions that people with asthma can take to manage their condition, reduce symptoms, and improve their quality-of-life which includes changing lifestyle, learning about asthma and taking prescribed medication. Despite availability of self-care recommendations, the implementation of self-care practice was not well studied in the world, particularly in developing countries including Ethiopia.

Objectives: The aim of this study was to assess self-care practice and associated factors among adult asthmatic patients on follow-up care at the public hospitals in East Wollega zone, West Ethiopia, 2023

Methods: An institutional-based cross-sectional study design was conducted among 413 adult asthmatic patients at the public hospitals in East Wollega zone from May 29 to July 29, 2023. The study participants were selected using a systemic random sampling technique. Data were collected through an interviewer-administered technique. Subsequently, the collected data were entered into Epidata version 4.6 and exported to SPSS version 27 for analysis. Associations between independent and dependent variables were assessed using binary logistic regression**.** Multivariable logistic regression analysis used an adjusted odds ratio (AOR) with a 95% confidence interval to identify factors associated with asthma self-care practices**.** Variables with a p-value< 0.05 were considered statistically significant

Results: A total of 413 study participants were included in the study. The finding of this study showed that nearly more than half of (51.6%) the study participants had good asthma self-care practice. Factors like no comorbidities (AOR: 2.0, 95% CI: 1.26-3.10), absence of alcohol consumption (AOR: 4.33, 95% CI: 2.52-7.44), non-smoking (AOR: 6.67, 95% CI: 2.46 -18.1) and social support (AOR: 1.57, 95% CI: 1.00-2.48) were significantly associated with good self-care practices among asthmatic patients. Data and result were presented in the form of word, frequency, tables, percentages, mean, standard deviation, median with interquartile range, range, and figures.

Conclusion and recommendation: Good asthma self-care practice in this study was slightly high. The finding of this study has a great contribution for patient on how to cope with asthma self-care and to alarm factors that hindering them from performing daily activities. The absence of comorbidities, never drinking alcohol or smoking, and having good social support were positively associated with good self-care practices. Therefore, public hospitals should create social support programs at hospital level who act on behavioral change such as how to cease alcohol consumption, cigarrete smoking and identifying asthmatic patient who had

comorbidity who have receiving follow up-care at their hospital, and strength self-care on how to reduce triggering factors for asthma exacerbation.

Strengths and limitations of this study

- The Strengths of this study was multi-center cross sectional which conducted at different level of hospitals (Primary, general, specialized and teaching hospital)
- The limitations of this study related with the outcome variable, self-care practice, was based on the patient's self-report data. This might increase or decrease the prevalence of self-care practice**;** and due to the nature of cross-sectional study design, cause and effect relationship between asthma self-care practice and associated factors cannot be established.

Introduction

Asthma is a heterogeneous disease usually characterized by chronic inflammation of the airways, it is defined by early respiratory symptoms such as wheezing, dyspnea, chest tightness, and cough that vary in time, intensity, and variable expiratory airflow limitation [1]. About 300 million people worldwide currently suffer from asthma, the number of people with asthma is projected to increase by about 100 million by 2025, and about 250,000 deaths from asthma have been reported worldwide, and more than 30 million people in the United States have been diagnosed with asthma during their lifetime [2]. In Africa like, Congo appears to have high rates of asthma prevalence 6.9% [3]

In Ethiopia, asthma is one of the most common public health problems, causing mortality and morbidity from respiratory diseases [4]. Its prevalence has increased in recent decades due to various contributing factors such as smoking, occupational hazards, presence of pests in the household, economic status of the household, residence of patients, and family history of asthma [5]

Asthma self-care practice is a set of actions that people with asthma can take to manage their condition, reduce symptoms, and improve their quality-of-life which includes changing lifestyle, learning about asthma and taking prescribed medication [6]

Self-care has emerged as a multifaceted component in the management of chronic illnesses because it is significantly associated with a spectrum of positive outcomes in these patients [7]. According to the Middle Range Theory of Self-Care practice of Chronic Illness, is defined as a group of behaviors focusing on the promotion of good health and treatment adherence (self-care maintenance), attentiveness to body and symptom recognition (self-care monitoring), and response to signs and symptoms when they occur (self-care management) [8, 9]

Asthma self-care practice is a strategy to control asthma symptoms and reduce future exacerbations [10]. Self-care practices are important for asthma control because they can improve knowledge, reduce hospitalizations, improve quality of life, prevent exacerbations, and cost effective [11]

Study conducted in Iraq, USA, and Saudi Arabia revealed that asthmatic patients attending hospitals exhibit low self-care practice about disease characteristics, reducing triggering factors, information provided by health profession, and behavioral factors [12-14].

Study conducted in Northern part of Ethiopia, high percentages (57.3%) of asthmatic patients attending governmental public hospitals demonstrate poor self-care practice which contributes to the increasing economic expense of poorly controlled asthma disease, also asthma can

significantly affect activity of daily life and lead to physical, emotional and social limitations, thereby impairing quality of life [15]

The reasons for poor implementation in clinical settings were due to different factors which include patients, professionals, and organizational factors, specifically older age, co-morbid illness, anxiety, lack of social support, and alcohol consumption have been identified as significant contributing factors [15]. The government of Ethiopia has decentralized Non-Communicable Diseases (NCDs) management including asthma, by training nurses at hospital level and health centers on who to visit and manage the patients prior to working in clinic setting [16].

Implementation of this policy is very important in prevention of asthma complications, management and developing positive attitude in asthma self-care practice [15]. Despite availability of self-care practice recommendations, the implementation of self-care practice was not well studied. Therefore, the study aimed to assess self-care practice and associated factors among asthmatic patients on follow-up care in public hospitals of East Wollega, West Ethiopia.

Methods

Study setting, and period

The study was conducted among adult asthmatic patients who attended at public hospitals in East Wollega, Ethiopia from May 29 to July 29, 2023. The East Wollega zone is composed of five hospitals such as Wollega University referral hospital, Nekemte Comprehensive specialized hospital, Gida Ayana general hospital, Arjo primary hospital and Sire primary hospital. The Wollega University referral hospital, and Nekemte Comprehensive specialized hospital are found in Nekemte city, which is a capital town of East Wollega zone, Gida Ayana general hospital is found in Northern part of Nekemte town, Arjo primary hospital is found in West part of Nekemte town and Sire primary hospital is found Southern part of Nekemte town. In those hospitals there are around 903 adult asthmatic patients receiving follow-up care, from which 234 patients were at Wollega University referral hospital, 241 at Nekemte Comprehensive specialized hospital, 258 at Gida Ayana general hospital ,95 at Arjo primary hospital, and 75 at Sire primary hospital respectively.

Study design: An institutional based cross-sectional study was employed

Source and study population

All adult asthmatic patients receiving follow-up care at public hospitals in East Wollega zone were taken as the source population and patients who had follow-up care in the selected hospitals during the data collection period were considered as the study population.

Inclusion and Exclusion Criteria

Adult asthmatic patients who visited at the public hospitals in East Wollega zone and had been receiving follow up care at least for six months prior to the data collection period was included in the study, and asthmatic patients who have mental problem and unable to communicate verbally were excluded from the study.

Sample size and sampling procedure

The sample size was calculated using the single population proportion formula through the Epi Info Stat Calc program with the assumption of; a 95% level of confidence, 5% margin of error, and 42.3 % proportion(p) of good asthma self-care practice from previous study conducted in Northern part of Ethiopia, Amhara region [15] $n=z^2\frac{P\,(1-P)}{d2}$.

Taking these assumptions, the estimated sample size was 375. Adding 10% of the non-response rate the final total sample size was calculated to be 413. The calculated sample was proportionally allocated to each hospital based on the previous three month's patient flow to outpatient department among asthmatic cases. Then, a systematic random sampling technique was used to select the study participants. To do this first; the total number of adult asthmatic patients who had attended the follow-up clinic in the previous 3months for each hospital used as a sampling frame. Total number of adult asthmatic patients who have follow-up care in clinic in the previous three months at five public hospitals were 903. The list of study participants was registered and coded on the prepared registration. Then sampling interval was calculated which was approximately two (2) for each hospital. From list of cards, the first participant interviewed was selected by using lottery method. Finally, every two intervals patient was interviewed. Data collection was conducting when study participants were come to outpatient department for follow up care based on his/her appointment by healthcare providers **(Fig 1)**

Dependent variable

Self- care practice of asthmatic patients

Independent variables

Socio-demographic characteristic: Sex, marital status, occupation, residence, education, income

Behavioral, attitude and knowledge related factors: history of cigarette smoking, history of alcohol consumption, physical exercise, social support, depression and anxiety, Knowledge about asthma self-care practice, attitude towards asthma

Clinical related factors: history of comorbidity, exacerbation factors**,** history of hospital admission**,** duration of treatment**,** age diagnosed for asthma**,** presence of exacerbation in past 12 months**,** family history of asthma

Operational definitions

Self-care practices refer to actions or tasks that people take on their own behalf to promote self-care, lessen asthma attacks and cope with illness [17]

Good self-care practice is when participants who scored above or equal to the mean of self-care practice related questions are considered as good asthma self-care practice, and poor self-care practice is when participants who scored below the mean self-care practice related questions are considered as poor asthma self-care practice [18]

Comorbidity is any chronic disease the patient has together with asthma for he/she is taking medications [19]

Good knowledge is when participants who scored greater than or equal to the mean of knowledge-related questions are categorized as having good knowledge, and poor knowledge is when participants who scored below the mean of knowledge-related questions are considered as having poor knowledge [20]

Social support is when participants who scored above or equal to the mean from multidimensional social support questions were referred to as having social support and those who scored below the mean considered as having no social support [21]

Anxiety and depression are when participants who scored between 0–7, 8-10 and 11–21 are taken as having normal, borderline, and abnormal among anxiety and depression question respectively [22]

Positive attitude is when participants who scored above or equal to the mean from attitude related question and negative attitude is when participants who scored above or equal to the mean from attitude related questions [23]

Alcohol drinking is defined as the use of any type of alcohol-based beverage, whether locally produced or manufactured in industries, by the participant/s in any volume regularly ranging from days to months. Occasional intakes for holidays, ceremonies, and intakes with a longer than monthly interval was ignored. According to this study, participants who had history of alcohol consumption has poor selfcare practice and who had no history of alcohol consumption is considered as good selfcare practice

Cigarette smoking is described as the habitual use of tobacco, whether locally produced or made in factories, by the participant/s on a daily, weekly, or monthly basis in any form or volume. According to this study, participants who had history of smoking has poor selfcare practice and who had no history of smoking is considered as good selfcare practice

Exercise is type of physical activity consisting of planned, structured, and repetitive movements done to improve or maintain physical fitness. E.g. walking, gymnastics, walking, jumping etc.

Data Collection tool and procedure

Data was collected by face-to-face interviews using a structured questionnaire which was adopted from relevant literature and standardized questionnaires to assess asthma self-care practices and associated factors among adult asthmatic patients receiving follow-up care [18, 20-22, 24]. The questions were prepared in English and then translated to Afaan Oromo by experts who are fluent in both languages and translated back to English to check for any consistencies. The tools had four main parts.

Part one: Socio-demographic variables which included age, sex, marital status, residence, ethnicity, educational status, and occupational status were assessed.

Part two: Clinical related factors which included age at which patients were diagnosed for asthma, presence of other comorbidity, triggering factors, history of hospital admission, duration of asthma treatment, presence of exacerbating factors in past 12 months, family history of asthma, and duration of illness were assessed.

Part three: Knowledge, attitude and behavioral factors which used to assess the following items. Social support was measured by using the Multidimensional Scale of Perceived Social Support [21]. The multidimensional scale of the perceived social support tool consisted of twelve items. For each item, participants rated on a five-point scale from one to five, 1 =very strongly disagree, 2=strongly disagree, 3= Neutral, 4= strongly agree, 5= Very strongly agree. The total score ranges from 12 - 60 which was calculated by summing up the scores for each item. Participants who scored above or equal to the mean from multidimensional social support questions were referred to as having social support and those who scored below the mean considered as having no social support [18]. Anxiety and depression were measured by using the Hospital Anxiety and Depression Scale (HADS) [18, 22].

The HADS consisted of fourteen items. Participants who scored between 0–7, 8–10, and 11–21 were taken as having normal, borderline, and higher levels of anxiety and depression respectively. The knowledge of asthma self-care practice was measured by using the knowledge of asthma self-care questionnaire (KASQ>50) calculated from summing the total

score ranged from 0 – 16 [20]. All questionnaires had alternatives from A - E. For respondent who correctly got answer (1) score and incorrect answer (0) score.

Participants who scored greater than or equal to the mean of knowledge-related questions were categorized as having good knowledge and those who scored below the mean were considered as having poor knowledge. The attitude of asthmatic questionnaire was consisted of five items composed of 5 levels of attitude ranged from 1 to 5; 5=strongly agree, 4= agree, 3= Neutral, 2= disagree, and 1= strongly disagree [18]. Participants with a score greater than mean out of attitude related questions were refereed to have a positive attitude, while those with a score less than mean were regarded to have a negative attitude [23].

Part four: Asthmatic self-care practice. The asthmatic self-care practice questionnaire was consisted of eight items. For each item, participants rated their self-care practice on a four-point Likert scale ranged from 1 to 4; 4= always perform, 3= frequent perform, 2= sometimes perform, and 1= never perform. The total score ranges from eight to thirty-two and is calculated by summing the scores for each item.

Participants who scored above or equal to the mean were considered as good asthma self-care practice whereas below the mean were taken as a poor asthma self-care practice [15, 18]. The tool was validated tool, and the pretest was conducted to evaluate the clarity of the tool before the actual date of the data collection period.

Data collection procedures

Data was collected by 5 BSc nurses and supervised by 2 BSc nurses who were trained about asthma self-care practice and associated factors among adult patients on follow-up care and who were working in clinical area. Patient who attends asthmatic clinic and fulfill the inclusion criteria was approached to participating in the data collection procedure. Data collectors were supervised by principal investigator and 2 BSc nurse supervisors.

Data quality control

A pretest was conducted among 5% (21) of the sample size at Shambu general Hospital in Horro Guduru Wollega. During the pretest, the questionnaire was checked for its clarity, simplicity, understandability, consistence, coherency, and applicability of the instruments.

A reliability test (Cronbach's alpha) was performed to check the internal consistence with 82% for asthmatic self-care practice, 91% for social support, 73% for anxiety and depression, 72% for knowledge of asthma self-care management, and 92% for attitude of asthma self-care practice. One-day training was given for both the data collectors and supervisors before the actual data collection on the contents of the questionnaires and how to maintain confidentiality

and privacy of the study subjects, and techniques of approaching the participants. Every day after data collections, questionnaires were reviewed and checked for completeness, accuracy, and clarity by principal investigator and supervisor.

Data processing and Analysis

The data were coded, checked for completeness, cleaned, and entered to Epi-data version 4.6, then exported to SPSS version 27 for analysis. Descriptive statistics were used to describe the variables. The results of the descriptive statistics were summarized in terms of frequency, tables, percentages, mean, standard deviation, median with interquartile, range, and figures. The outcome variable was dichotomized into good and poor based on the analyzed mean scores.

Binary logistic regression was done to see the associated between the outcome variable and each of explanatory variables. Those independent variables that have p-value < 0.25 were selected to become a candidate for multivariable logistic regression analysis. Again, after doing multivariable logistic regression, the statistical significance of associations between variables was determined using odds ratios with 95% confidence interval (CI) and p-value < 0.05 was considered statistically significant. Backward LR method was used to identify the independent predictors of asthmatic self-care. Hosmer's and Lemishow goodness of fit test was used to test the model fitness which was 0.887. Also, multicollinearity was checked by using tolerance and Variance Inflation Factor (VIF). Since there was no severe multicollinearity between independent variables; the result of VIF were between (1.074 - 1.237), and tolerance (0.802 - 0.932)

Ethical Consideration

Ethical clearance and official letter were obtained from the Research and Ethics Committee of Institute of Health Science Wollega University to the selected public health hospitals. Formal letter was written for respective hospitals. Again, permission was obtained from respective hospitals. After explaining the purpose and possible benefit of the study, written consent was obtained from each participant before starting data collection. Study participants were informed of their right to refuse or discontinue participation at any time and ask any question during the data collection process. The confidentiality of patients was kept throughout the study. For the purpose of confidentiality, the names and any personal identifiers of the participants had not been recorded but code number had used.

Results

Socio-demographic characteristics of the study participants

A total of 413 participants were included in the study, resulting in a 100% response rate. The median age of participants was 44 years with inter quartile range (IQR) of 35-57 years. One hundred eight-two (44.1%) of the study participants were in the range of 35-54 years. Among the study participants, 220(53.3%) were male. Majority of participants, 239(57.9%) were married. Nearly more than half of study respondents 219(53%) were protestant followers. Regarding ethnicity, most of participants, 370(89.6%) were belongs to Oromo ethnic group. While 241(58.4%) resided in urban areas. Regarding educational status, about 124(30%) was unable to read and write. One hundred twenty-one (29.3%) of the respondents were farmers. The median average monthly income of household was 900 ETB (IQR) of 400-2650 ETB **(Table 1)**

Table 1: Socio demographic characteristics of adult asthmatic patients at public hospitals in East Wollega zone receiving follow-up care OPD, Western Ethiopia, 2023 (n=413)

Variables	Categories	Frequency	Percent
Sex	Male	220	53.3
	Female	193	46.7
Marital status	Single	100	24.2
	Married	239	57.9
	Divorced	40	9.7
	Widowed	34	8.2
Educational status	Unable to read & write	124	30
	Primary school	89	21.5
	Secondary school	111	26.9
	College and above	89	21.5
Occupational status	Student	58	17
	Daily labor	65	15.7
	Farmer	121	29.3
	House wife	58	14
	Merchant	56	13.6
	Civil servant	55	13.3
Average monthly income (ETB)	≤1000	242	58.6
	1001-2000	56	13.6
	2001-3000	23	5.6
	3001-4000	20	4.8
	≥4001	72	17.4

Clinical characteristic of the study participants

Concerning clinical characteristic of the study participants, nearly half of the study participants, 198(47.9%) were approximately, diagnosed with asthma between the ages of 25-49 years. About 136 (32.9%) participants had asthma illness for duration of 2-5 years. Additionally, about 170(41.2%) participants had a family history of asthma. Among study participants, about 161 (39%) had co-morbid illness of which 53(12.8%) had hypertension. Around three fourth of study participants, 286(69.2%) had a history of frequent asthma exacerbation with in last year. Less than half of study participants, 151(36.6%) had been admitted in the hospital in the last 12 months, from this 42(27.8%) was admitted to hospital by the cause of asthma. Furthermore, majority of the study participants, 350(84.7%) had triggering factor to seasonal variations **(Table 2)**

Table 2: Clinical characteristics of adult asthmatic patients at public hospitals in East Wollega zone receiving follow up OPD, West Ethiopia,2023 (n=413)

Variables	Categories	Frequency	Percent
Duration living with asthma (year)	<2	73	17.7
	2-5	136	32.9
	6-10	105	25.4
	11-20	70	16.9
	>20	29	7.0
Family history of asthma	Yes	170	41.2
	No	243	58.8
History of co-morbidity	Yes	161	39.0
	No	252	61.0
Types of co-morbidity	Heart failure	25	15.5
	Diabetes mellitus	29	18
	Renal disease	33	20.5
	Hypertension	53	33
	Others**	21	13
History of asthma exacerbation in the last 12 months	Yes	286	69.2
	No	127	30.8
History of admission to hospital in last 12 months	Yes	151	36.6
	No	262	63.4
If yes, cause of admission	Asthma	42	27.8
	Others***	109	72.2
Triggering factors can exacerbate asthma attack	Yes	350	84.7
	No	63	15.3

Knowledge, attitude, and behavior characteristics of the study participants

One hundred-twelve (27.1%) of participants were ever consumed alcohol, among them 57(50.9%) of participants were currently consuming alcohol. Fifty-four (12.1 %) of participants were ever cigarette smoker, thirty-one (57.4%) were currently smoking cigarette at greater than eleven stick per day, and 348(84.5%) had regular physical exercise.

Among the study participants, half of them 207 (50.1%) had no social support, and about 78.7% and 54.7% of study participants had anxiety and depression respectively. From the study participants, 155(37.5%) had poor knowledge about asthma self-care practice. Additionally, less than half, 147(35.6%) of study participants had negative attitude about asthma self-care practice **(Table 3).**

Proportion of asthma self-care practice

Among the 413 study participants, 213(51.6%) had asthma good self-care practice with 95% CI (46.7, 56.4) **(Figure :2)**

Table 3: Knowledge, attitude and behavioral characteristics of adult asthmatic patients at public hospitals in East Wollega zone receiving follow up care OPD, West Ethiopia,2023(n=413)

Variables	Categories	Frequency	Percent
Are you ever drinker alcohol	Yes	112	27.1
	No	301	72.9
Are you currently drinking alcohol	Yes	57	50.9
	No	55	49.1
If yes, how many times a week	<2	20	35
	≥2	37	65
Are you ever smoker	Yes	54	13.1
	No	359	86.9
Are you currently cigarette smoke	Yes	31	57.4
	No	23	42.6
If yes, how many cigarettes do you smoke per day	<5	7	22.6
	5-10	6	19.4
	≥11	18	58
Have you doing regular physical exercise	Yes	349	84.5
	No	64	15.5
If yes, which physical exercise do you practice	Walking	316	90.6
	Gymnastic	13	3.7
	Running	20	5.7
Duration of doing physical exercise per day (in minute)	<30 minutes	193	46.7
	≥ 30 minutes	156	37.8
Social support	Have social support	206	49.9
	No social support	207	50.1
Anxiety	Normal	12	2.9
	Borderline	76	18.4
	Abnormal	325	78.7
Depression	Normal	97	23.5
	Borderline	90	21.8
	Abnormal	226	54.7
Knowledge	Poor knowledge	155	37.5
	Good knowledge	258	62.5
Attitude	Negative attitude	147	35.6
	Positive attitude	266	64.4

Factors associated with self-care practice

Bivariable logistic regression was used to identify an association between each independent variables and the outcome variable (asthma self-care practice). Those variables which showed an association at p value < 0.25 variables were entered into the multivariable logistic regression model. In the binary logistic regression analysis residence, co-morbidity, family history of asthma, history of asthma exacerbation, seasonal variations, pests, ever alcohol consumption, ever smoking cigarrete, social support, depression, and attitude were variables candidate for multivariable with having a p-value < 0.25. In the multivariable logistic regression analysis, co-morbidity, ever smoked cigarrete, ever alcohol consumed, and social support were found to be significant predictors of self-care practice of asthmatic patients.

The absence of co-morbidity was found to have a significant association with good self-care practice. Participants without any co-morbidity had higher odds of good self-care practice as compared to those with co-morbidity (AOR: 2.0, 95% CI: 1.26-3.10).

There was a significant association between never consuming alcohol and self-care practice. Participants who reported never consuming alcohol had higher odds of good self-care practice as compared to those who had ever consumed alcohol (AOR: 4.33, 95% CI: 2.52-7.44). Participants who reported never smoking had significantly association with good self-care practice as compared to those who ever smoked. The odds of good self-care practice were lower among individuals who reported ever smoking (AOR: 6.67, 95% CI: 2.46-18.1)

Participants who reported having social support showed a significant association with good self-care practice. Participants with social support had higher odds of good self-care practice as compared to those without social support (AOR: 1.57, 95% CI: 1.00-2.48). **(Table 4)**

Discussion

This study was aimed to assess the magnitude of good self-care practice and associated factors among adult asthmatic patients on the follow-up care at public hospitals in East Wollega zone, West Ethiopia. Accordingly, nearly more than half of (51.6%) the study participants revealed to have a good asthma self-care practice in the study area. The finding of this study is in line with a study conducted in Bangladesh [18] and Taiwan [25] in which good asthma self-care practice was found to be 49.63% and 51.5% respectively. On the contrary, this finding is lower than the study conducted in Saudi Arabia 57.1% [14]. In Saudi Arabia, this discrepancy might be due to the differences of health-related information received, study design (mixed method), and availability of resource and

Table 4: Bivariable and multivariable logistic regression analysis for factors associated with good self-care practice among patients with asthmatic receiving follow up-care OPD at public hospitals in East Wollega zone, West Ethiopia, 2023(n=413)

Variables	Categories	Self-care practice		COR 95% CI	p-value	AOR 95% CI	p-value
		Good	Poor				
Family history of asthma	Yes	91	79	1			
	No	109	134	1.42(0.96-2.10)	0.08	1.24(0.79-1.95)	0.35
Co-morbidity	Yes	99	62	1		1	
	No	101	151	2.39(1.59-3.58)	0.01	**2(1.26-3.10) ***	0.03
History of asthma	Yes	147	139	1			
	No	53	74	1.48(0.97-2.25)	0.07	1.10(0.67-1.83)	0.70
Seasonal variations	Yes	176	174	1			
	No	24	39	1.64(.95-2.85)	0.08	1.56(0.83-2.93)	0.17
Pests	Yes	98	88	1			
	No	102	125	1.37(0.93-2.01)	0.12	1.26(0.79-2.00)	0.32
Ever Alcohol drank	Yes	88	24	1		1	
	No	112	189	6.19(3.72-10.29)	0.01	**4.33(2.52-7.44) ***	0.01
Ever Smoked	Yes	49	5	1		1	
	No	150	208	13.59(5.25-34.69)	0.01	**6.67(2.46-18.1) ***	0.01
Social support	Have social support	124	82	2.56(1.72-3.80)	0.01	**1.57(1.00-2.48) ***	0.04
	No social Support	77	130	1		1	
Depression	Normal	51	46	1.06(0.47-1.22)	0.25	1.06().57-1.77)	0.99
	Borderline	46	44	1.25(0.49-1.31)	0.37	0.79(0.45-1.40)	0.43
	Abnormal	103	123	1			
Attitude	Positive	122	144	0.75(1.24-1.99)	0.16	1.04(0.64-1.69)	0.87
	Negative	78	69	1		1	

health facilities, health education programs improved patient's knowledge about self-care, inadequate sample size (125), lifestyle modification, and socio-demographic characteristics of study participants on asthma self-care practice. Also, this finding was higher than the studies conducted in the Northern part of Ethiopia 42.3% [15], and Rwanda 33.8% [17].

In Northern part of Ethiopia, this discrepancy might be due to the socio-demographic characteristics of study participants (30.2% had no formal education), they didn't assess patient's attitudes toward asthma self-care practice, inadequate number of study settings (only on three hospitals), study participants had poor knowledge of asthma self-care practice (41.5%), and socio-cultural practice of the study participants (75.5% habit of alcohol consumption).

In Rwanda, this discrepancy might be due to the behavioral factors (45.5% had habit of alcohol consumption), study period, inadequate sample size, and study setting was conducted on three health centers and one hospital. Additionally, knowledge of study participants and patient's attitude towards asthma self-care practice in current study is high when compared with study conducted in northern part of Ethiopia and Rwanda

Asthmatic patients who had social support were 1.57 times more likely to have good asthma self-care practice as compared to those who had no social support. This finding suggest that having social support may increase self-care which leading to good self-care pracice. This result was similar with the study conducted in Northern part of Ethiopia, which showed that asthmatic patients who had no social support were nearly two times more likely to have poor self-care practices as compared to those who had social support [15]. Another study conducted in US; also support this finding, which showed that social support from families and friends are important for persons with chronic illness such as asthmatics to develop a positive self-concept and self-esteem to give emotional and social support for the implementation of self-care practice particularly in medication adherence and accompying the patient to health facilites on the date of appoitment [24, 25]

Asthmatic patients who had no co-morbidity illness were 2 times more likely to have good asthma self-care practices when compared to those patients who have comorbid illness. This suggests that having co-morbidities increases the likelihood of poor self-care practice among the participants. This result was in line with the study conducted in Northern part of Ethiopia, asthmatic cases who had a co-morbid illness were nearly two times more likely to have poor selfcare practices as compared to those participants who have no comorbid illness[15]. Co-morbidities illness worsen the conditions of the patient and make them unable to adhere to

selfcare practice, complicate the diagnosis and management system which can lead to misdiagnosis and under treatment or over treatment[26]

The asthmatic patients who didn't smoke cigarettes were 6.67 times more likely to have good asthma self-care practices when compared to those asthmatic patients who did smoke cigarettes. This study supported by the study done in Taiwan which reveals patients with no smoking history have a better asthma self-care practices than those who continue to smoking [25]. Different scholars suggests that a history of smoking is associated with an increased likelihood of engaging in poor self-care practices which will destroy the lung and alveolus, particularly for those who smoke more than 11 sticks cigarettes per day, which appears to be an important triggering factor for the asthmatic response to worsen[27]. According to Global Initiative for Asthma Strategy 2021 reported , abstaining from smoking is considered as self-care practice, especially for an asthmatic patient, because smoking significantly worsen asthma symptoms and lead to more severe health complications, by choosing to abstain from smoking, the patient is actively managing their health and taking steps to improve their respiratory function and overall well-being[28]. Cigarette smoking has been associated with an accelerated decline in lung function, increased health service use, and increase severity in patients with asthma, providing insight of patients on how to cessation smoking improves lung function among adult asthmatic patients. However, as a result, asthmatic patients who smoke cigarettes might have poor self-care practices[29].

The asthmatic patients who did not consume alcohol were 4.33 times more likely to have good self-care practices when compared to those asthmatic patients who consume alcohol. This indicates that individuals who have a history of alcohol consumption are more likely to exhibit poor self-care practices. This finding was similar to the study conducted in the northern part of Ethiopia which showed that asthmatic patients who consumed alcohol were nearly two times more likely to develop poor self-care practices when compared to those who had not consume alcohol[15]. Drinking alcohol, especially wine, appeared to be an important trigger for the asthmatic response that worsens, and causes alcohol-induced asthma, which causes pathological bronchoconstriction that affects many patients with asthma[30].

Also consumptions of alcohol can damage the lungs and induce asthma exacerbations; as a result, asthmatic patients who drink alcohol might forget to take their medicines and exhibit reduced self-care practices[17]

Conclusion and Recommendations

The study indicates that slightly more than half of the asthmatic patients in the study area demonstrated good self-care practice. This signifies that a large number of asthmatic patients may not be fully engaging in the recommended self-care practice. The study also concluded that not having comorbid illnesses, never drinking alchol, being non-smoker, and having good social support were significantly associated with good self-care practices of asthmatic patients in the study area. Therefore, Public hospitals should create social support programs at hospital level who act on behavioral change such as how to cease alcohol consumption, cigarrete smoking and identifying asthmatic patient who had comorbidity on receiving follow up-care at their hospital, and strength self-care on how to reducing triggering factors for asthma exacerbation.

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Ethical approval: The study was approved by research and ethical review committee of Institute of health science Wollega University with reference number WU/RD/655 on the date of 21/09/2015 E.C. All protocols are carried out in accordance with the rules and regulation of the ethical guideline of the Wollega University. Informed consent was obtained from each study participant before part. No personal identifiers such as name, ID number, and phone number were used. The information obtained from each study participants was kept secured, locked, and stored.

Dissemination to participants and related patient and public communities: Dissemination to the general population will be made through social media outlets by the host institution, and on publication of this study

Data availability statement: Data are available upon reasonable request. The data sets used and/or analyzed during the current study are available from the corresponding author on reasonable request

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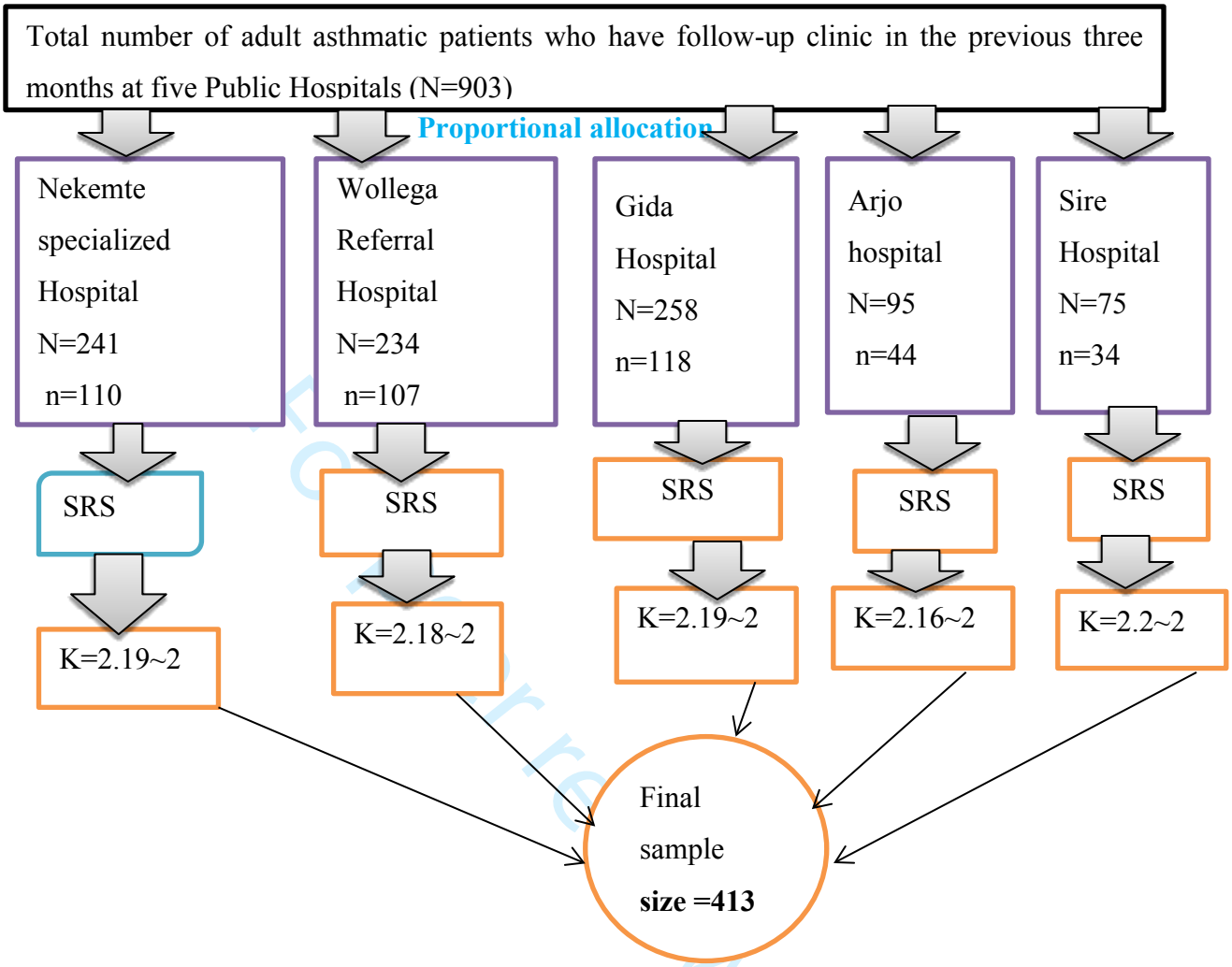
Figure 1: Schematic presentation of proportional allocation of the sample size for each public hospital in East Wollega Zone, West Ethiopia, 2023

Figure 2. Self-care practices of adult asthmatic patients at public hospitals in East Wallaga zone receiving follow up care OPD, West Ethiopia,2023



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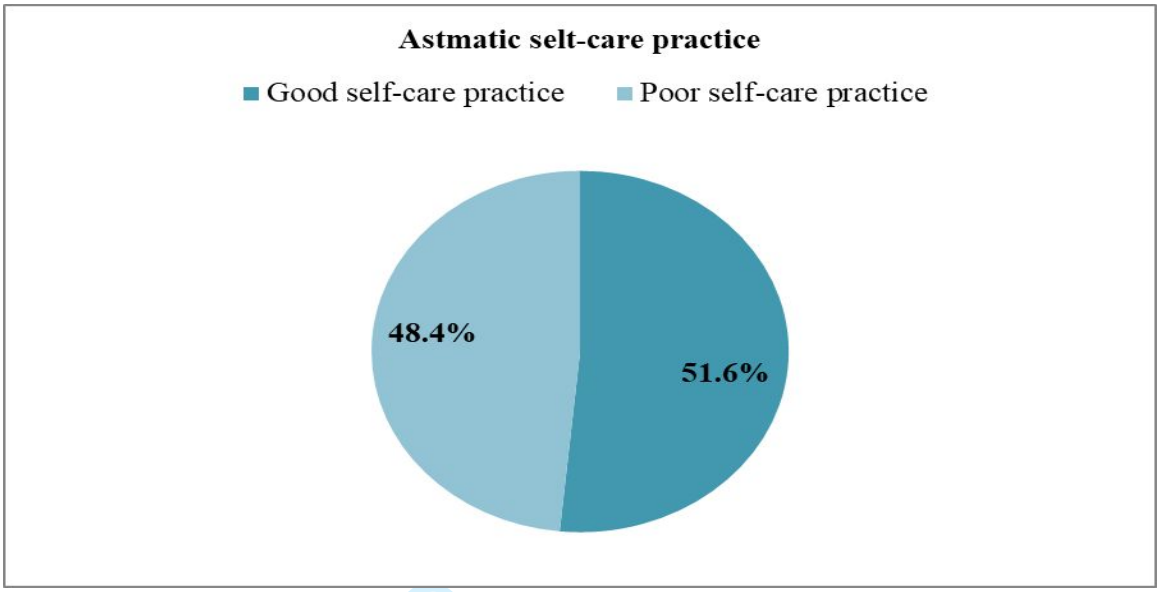

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SELF-CARE PRACTICE AND ASSOCIATED FACTORS AMONG ADULT ASTHMATIC PATIENTS ON FOLLOW UP-CARE AT PUBLIC HOSPITALS IN EAST WALLAGA ZONE, WEST ETHIOPIA: A CROSS-SECTIONAL STUDY, 2025

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Abstract

Objectives: This study aimed to assess self-care practices and the factors associated with them among adult asthmatic patients receiving follow-up care at public hospitals in the East Wallaga Zone of West Ethiopia in 2023

Design: A cross-sectional study conducted in an institutional setting

Setting: The research was carried out in government hospitals, including two primary hospitals, one general hospital, and two comprehensive specialized hospitals, from May 29 to July 29, 2023

Participants: A systematic random sample of 413 adult asthmatic patients undergoing follow-up care at public hospitals in the East Wallaga zone was selected. Data were collected using a structured, self-administered questionnaire, which was then entered into Epidata version 4.6 and analyzed using SPSS version 27.

Outcome measures: The primary outcome measure was the classification of asthma self-care practices as either good or poor

Results: The findings revealed that 51.6% (95% CI: 46.7% to 56.4%) of participants exhibited good asthma self-care practices. Significant factors associated with good self-care included the absence of comorbidities (AOR 2.0, 95% CI: 1.26-3.10), non-consumption of alcohol (AOR 4.33, 95% CI: 2.52-7.44), non-smoking status (AOR 6.67, 95% CI: 2.46-18.1), and the presence of social support (AOR 1.57, 95% CI: 1.00-2.48).

Conclusion: The study found a relatively high prevalence of good asthma self-care practices among participants. Key factors positively associated with these practices included the absence of comorbidities, non-consumption of alcohol and tobacco, and strong social support. It is recommended that public hospitals and healthcare management implement strategies to promote behavioral changes and enhance self-care education aimed at reducing asthma exacerbation triggers.

Strengths and limitations of this Study

- ✓ This study was carried out across all hospitals located in the East Wollega zone as a multicenter investigation.

- ✓ The research employed face-to-face interview techniques, resulting in a 100% response rate.
- ✓ A limitation of this study is the potential for participant response bias, which may lead to an overestimation or underreporting of self-care practices.
- ✓ The reliance on self-reported data may introduce inaccuracies, as participants might not accurately remember their asthma self-care practices.
- ✓ A qualitative design, which could have strengthened the findings of this cross-sectional study, was not utilized.

Introduction

Asthma is a heterogeneous disease typically characterized by chronic inflammation of the airways. It is defined by early respiratory symptoms, including wheezing, dyspnea, chest tightness, and cough, which can vary in frequency, intensity, and expiratory airflow limitation.[1] Currently, approximately 300 million people worldwide suffer from asthma, with projections indicating an increase of about 100 million cases by 2025. Asthma is responsible for around 250,000 deaths globally, and more than 30 million individuals in the United States have been diagnosed with the condition at some point in their lives.[2] In Africa, countries such as the Democratic Republic of the Congo exhibit notably high asthma prevalence rates, estimated at 6.9%.[3] In Ethiopia, asthma represents one of the most significant public health challenges, contributing to both morbidity and mortality related to respiratory diseases.[4] The prevalence of asthma has risen in recent decades due to various factors, including smoking, occupational hazards, pest infestations in households, economic status, residential environment, and family history of asthma.[5] Asthma self-care practices encompass a range of actions that individuals with asthma can undertake to effectively manage their condition, reduce symptoms, and enhance their quality of life. This includes making lifestyle changes, educating themselves about asthma, and adhering to prescribed medications.[6]

Self-care has become a crucial aspect of managing chronic illnesses, as it is closely linked to a range of positive outcomes for these patients.[7] According to the Middle Range Theory of Self-Care practice of Chronic Illness defines self-care as a set of behaviors aimed at promoting overall health and ensuring adherence to treatment (self-care maintenance), being mindful of one's body and recognizing symptoms (self-care monitoring), and responding appropriately to signs and symptoms as they arise (self-care management.[8-9]

Asthma self-care practices are strategies designed to manage asthma symptoms and minimize the risk of future exacerbations.[10] Self-care practices play a crucial role in managing asthma as they enhance knowledge, decrease hospitalizations, improve quality of life, prevent exacerbations, and are cost-effective.[11] A study conducted in Iraq, the USA, and Saudi Arabia found that asthmatic patients visiting hospitals demonstrate inadequate self-care practices regarding disease characteristics, management of triggering factors, information received from healthcare professionals, and behavioral factors.[12-14]

A study conducted in the northern region of Ethiopia found that a significant percentage (57.3%) of asthmatic patients visiting government public hospitals exhibit poor self-care practices. This inadequacy not only contributes to the rising economic costs associated with poorly managed asthma but also significantly impacts daily activities, resulting in physical, emotional, and social limitations that ultimately diminish quality of life.[15]

he poor implementation of clinical practices can be attributed to various factors, including those related to patients, healthcare professionals, and organizational aspects. Notably, older age, co-morbid conditions, anxiety, lack of social support, and alcohol consumption have been identified as significant contributors to this issue.[15] The government of Ethiopia has decentralized the management of Non-Communicable Diseases (NCDs), including asthma, by providing training to nurses at both hospitals and health centers. This training focuses on how to identify and manage patients before they enter a clinical setting.[16] The implementation of this policy is crucial for preventing asthma complications, effectively managing the condition, and fostering a positive attitude towards self-care practices in asthma management.[15] Although there are recommendations for self-care practices, their implementation has not been extensively studied. Consequently, this research aimed to evaluate self-care practices and the factors associated with them among asthmatic patients receiving follow-up care in public hospitals in East Wallaga, West Ethiopia.

Methods

Study setting, and period

This study was conducted among adult asthmatic patients attending public hospitals in East Wollega, Ethiopia, from May 29 to July 29, 2023. The East Wollega zone includes five hospitals: Wollega University Referral Hospital, Nekemte Comprehensive Specialized Hospital, Gida Ayana General Hospital, Arjo Primary Hospital, and Sire Primary Hospital. Wollega University Referral Hospital and Nekemte Comprehensive Specialized Hospital are

located in Nekemte city, the capital of East Wollega zone. Gida Ayana General Hospital is situated in the northern part of Nekemte town, Arjo Primary Hospital is found in the west, and Sire Primary Hospital is located in the south. Approximately 903 adult asthmatic patients are receiving follow-up care across these hospitals, with 234 patients at Wollega University Referral Hospital, 241 at Nekemte Comprehensive Specialized Hospital, 258 at Gida Ayana General Hospital, 95 at Arjo Primary Hospital, and 75 at Sire Primary Hospital respectively

Study design: An institutional based cross-sectional study design was employed

Source and study population

The source population consisted of all adult asthmatic patients receiving follow-up care at public hospitals in East Wollega zone. The study population included those patients who received follow-up care at the selected hospitals during the data collection period.

Inclusion and Exclusion Criteria

Adult asthmatic patients who visited public hospitals in East Wollega zone and had been receiving follow-up care for at least six months prior to the data collection period were included in the study. Patients with mental health issues that hindered verbal communication were excluded.

Sample size and sampling procedure

The sample size was determined using the single population proportion formula through the Epi Info Stat Calc program, based on a 95% confidence level, a 5% margin of error, and a 42.3% proportion (p) of good asthma self-care practices from a previous study conducted in the Amhara region of Northern Ethiopia,[15] the formula used was: $n=z^2\frac{P\,(1-P)}{d2}$.

Based on these assumptions, the estimated sample size was calculated to be 375. To account for a 10% non-response rate, the final sample size was adjusted to 413. This sample was proportionally allocated to each hospital based on patient flow data from the outpatient department over the previous three months. A systematic random sampling technique was employed to select study participants

The total number of adult asthmatic patients who attended the follow-up clinic in the previous three months across all five hospitals served as the sampling frame. With a total of 903 patients identified, a list of potential participants was created and coded. The sampling interval was calculated to be approximately two (2) for each hospital. The first participant was selected randomly using a lottery method, and subsequently, every second patient on the list was interviewed. Data collection occurred when study participants came to the outpatient department for follow-up care as per their appointments with healthcare providers (Fig 1)

Dependent variable

Self- care practice of asthmatic patients

Independent variables

Socio-demographic characteristic: age, sex, marital status, occupation, residence, education, income

Behavioral, attitude and knowledge related factors: history of cigarette smoking, history of alcohol consumption, physical exercise, social support, depression and anxiety, Knowledge about asthma self-care practice, attitude towards asthma

Clinical related factors: history of comorbidity, exacerbation factors**,** history of hospital admission**,** duration of treatment**,** age diagnosed for asthma**,** presence of exacerbation in past 12 months**,** family history of asthma

Operational definitions

Self-care practices refer to actions or tasks that people take on their own behalf to promote self-care, lessen asthma attacks and cope with illness.[17]

Good self-care practice is when participants who scored above or equal to the mean of self-care practice questionnaire are considered as good asthma self-care practice, and poor self-care practice is when participants who scored below the mean self-care practice questionnaire are considered as poor asthma self-care practice.[18]

Comorbidity is any chronic disease the patient has together with asthma for he/she is taking medications.[19]

Good knowledge is when participants who scored greater than or equal to the mean of knowledge-related questions are categorized as having good knowledge, and poor knowledge is when participants who scored below the mean of knowledge-related questions are considered as having poor knowledge.[20]

Social support is when participants who scored above or equal to the mean from multidimensional social support questions were referred to as having social support and those who scored below the mean considered as having no social support.[21]

Anxiety and depression are when participants who scored between 0–7, 8-10 and 11–21 are taken as having normal, borderline, and abnormal among anxiety and depression question respectively.[22]

Positive attitude is when participants who scored above or equal to the mean from attitude related question and negative attitude is when participants who scored above or equal to the mean from attitude related questions.[23]

Alcohol drinking is defined as the use of any type of alcohol-based beverage, whether locally produced or manufactured in industries, by the participant/s in any volume regularly ranging from days to months. Occasional intakes for holidays, ceremonies, and intakes with a longer than monthly interval was ignored.

Cigarette smoking is described as the habitual use of tobacco, whether locally produced or made in factories, by the participant/s on a daily, weekly, or monthly basis in any form or volume.

Exercise is type of physical activity consisting of planned, structured, and repetitive movements done to improve or maintain physical fitness. E.g. walking, gymnastics, walking, jumping and etc.

Data Collection tool and procedure

Data collection for this study was conducted through face-to-face interviews using a structured questionnaire. The questionnaire was adopted from relevant literature and standardized tools designed to assess asthma self-care practices and associated factors among adult asthmatic patients receiving follow-up care.[18,20-22,24] The original questions were prepared in English and subsequently translated into Afaan Oromo by experts fluent in both languages. To ensure consistency and accuracy, the translated questionnaire was then translated back to English, allowing researchers to verify that the meaning of the questions remained intact. The structured questionnaire consisted of four main parts:

Part one: Demographic Variables: This section collected information on participants' age, sex, marital status, residence, ethnicity, educational status, and occupational status. These variables were essential for understanding the demographic profile of the study participants

Part two: Clinical Related Factors: This section assessed various clinical factors including: Age at which patients were diagnosed with asthma, Presence of other comorbidities, Identified triggering factors for asthma attacks, History of hospital admissions due to asthma, Duration of asthma treatment, Presence of exacerbating factors in the past 12 months, Family history of asthma, Duration of illness

Part three: Knowledge, attitude and behavioral factors: This part focused on assessing participants' knowledge, attitudes, and behaviors related to asthma management

Social support: Social support was measured using the Multidimensional Scale of Perceived Social Support (MSPSS), which consists of twelve items designed to evaluate perceived social support from family, friends, and significant others.[21] Participants rated each item on a five-point scale, where 1 = very strongly disagree, 2 = strongly disagree, 3 = neutral, 4 = strongly agree, and 5 = very strongly agree. The total score for the Multidimensional Scale of Perceived Social Support (MSPSS) ranged from 12 to 60, calculated by summing the scores of all items. Participants who scored equal to or above the mean were classified as having social support, while those scoring below the mean were considered to have no social support.[18]

Anxiety and depression levels were assessed using the Hospital Anxiety and Depression Scale (HADS), which consists of fourteen items. Scores were interpreted as follows: 0–7 indicated normal levels, 8–10 indicated borderline levels, and 11–21 indicated higher levels of anxiety and depression respectively.[18,22]

Knowledge regarding asthma self-care was measured using the Knowledge of Asthma Self-Care Questionnaire (KASQ), which consisted of items scored from 0 to 16. Each question had multiple-choice options labeled A to E, with correct answers receiving a score of 1 and incorrect answers a score of 0. Participants scoring equal to or above the mean on knowledge-related questions were categorized as having good knowledge, while those scoring below the mean were classified as having poor knowledge.[20]

Participant Attitude Questionnaire included five items rated on a scale from 1 to 5 (1 = strongly disagree; 5 = strongly agree). Participants scoring above the mean on these attitude-related questions were classified as having a positive attitude, whereas those scoring below the mean were considered to have a negative attitude.[23]

Part four: Asthmatic self-care practice: The Asthma Self-Care Practice Questionnaire comprised eight items. Participants rated their self-care practices on a four-point Likert scale: 1 = never perform, 2 = sometimes perform, 3 = frequently perform, and 4 = always perform. The total score ranged from eight to thirty-two, calculated by summing the scores for each item. Participants scoring equal to or above the mean were deemed to have good asthma self-care practices, while those scoring below the mean were categorized as having poor asthma self-care practices.[15,18] The tool was validated tool and the pretest was conducted to assess its clarity before the main data collection began.

Data collection procedures

Data collection was carried out by five BSc nurses under the supervision of two BSc nurses who had been trained in asthma self-care practices and associated factors among adult patients receiving follow-up care. Patients attending the asthma clinic who met the inclusion criteria were approached to participate in the study. The data collectors were overseen by the principal investigator and two supervising nurses

Data quality control

A pretest involving 5% of the sample size (21 participants) was conducted at Shambu General Hospital in Horro Guduru Wollega. This pretest evaluated the questionnaire for clarity, simplicity, understandability, consistency, coherence, and applicability.

A reliability test using Cronbach's alpha was performed to assess internal consistency: 82% for asthma self-care practices, 91% for social support, 73% for anxiety and depression, 72% for knowledge of asthma self-care management, and 92% for attitudes toward asthma self-care practices. A one-day training session was provided for both data collectors and supervisors prior to actual data collection, covering questionnaire content, confidentiality maintenance, participant engagement techniques, and privacy considerations. Daily reviews of completed questionnaires were conducted by the principal investigator and supervisors to ensure completeness, accuracy, and clarity.

Data processing and Analysis

The data were coded, verified for completeness, cleaned, and entered into EpiData version 4.6 before being exported to SPSS version 27 for analysis. Descriptive statistics were employed to characterize the variables. The outcomes of the descriptive analysis were presented as frequencies, tables, percentages, means with standard deviations, medians with interquartile ranges, and ranges. The outcome variable was categorized into two groups: good and poor, based on the analyzed mean scores. A binary logistic regression analysis was conducted to examine the associations between the outcome variable and each explanatory variable. Independent variables with a p-value less than 0.25 were selected as candidates for multivariable logistic regression analysis. Following this, multivariable logistic regression was performed, and the statistical significance of the associations between variables was assessed using odds ratios with a 95% confidence interval (CI), where a p-value of less than 0.05 was deemed statistically significant. The backward likelihood ratio (LR) method was employed to identify independent predictors of asthmatic self-care. The model's goodness of fit was evaluated using the Hosmer-Lemeshow test, which yielded a value of 0.887. Additionally, multicollinearity was assessed using tolerance and the Variance Inflation Factor (VIF). There

was no evidence of severe multicollinearity among the independent variables, as the VIF values ranged from 1.074 to 1.237, and tolerance values ranged from 0.802 to 0.932.

Consent to participate

A formal letter of cooperation was prepared and submitted to the public hospitals in the East Wollega Zone. Permission to conduct the study was subsequently granted by the medical director of each hospital. Participants were provided with a comprehensive overview of the study's objectives and instructed on how to complete the questionnaire. They were assured that all information would be treated with the utmost confidentiality. Written informed consent was obtained from each participant prior to their involvement in the study.

Patient and Public Involvement

Patients and the public were not involved in the design, conduct, reporting, interpretation, or dissemination plans of our research. They were not invited to contribute to the writing or editing of this document for clarity or accuracy. However, patients and the community played a role in selecting the research topic as a priority issue. They will also be engaged in disseminating the results and during interventions addressing the identified gaps.

Dissemination: The findings of this study will be shared with Wollega University, the East Wollega Zonal Health Office, the five selected hospitals, and other relevant organizations. Additionally, the results will be published in a peer-reviewed journal.

Results

Socio-demographic characteristics of the study participants

A total of 413 participants took part in the study, achieving a 100% response rate. The median age of the participants was 44 years, with an interquartile range (IQR) of 35 to 57 years. Among the participants, 182 (44.1%) were aged between 35 and 54 years. The gender distribution indicated that 220 (53.3%) of the participants were male. The majority, 239 (57.9%), were married. More than half of the respondents, 219 (53%), identified as Protestant. In terms of ethnicity, the vast majority, 370 (89.6%), belonged to the Oromo ethnic group. Additionally, 241 (58.4%) lived in urban areas. Regarding educational attainment, approximately 124 (30%) were unable to read and write, while 121 (29.3%) identified as farmers. The median monthly household income was 900 ETB, with an IQR of 400 to 2650 ETB (Table 1).

Table 1: Socio demographic characteristics of adult asthmatic patients at public hospitals in East Wallaga zone receiving follow-up care OPD, Western Ethiopia, 2023 (n=413)

Variables	Categories	Frequency	Percent
Sex	Male	220	53.3
	Female	193	46.7
Age groups(years)	18-34	100	24.2
	35-54	182	44.1
	≥55	131	37.1
Marital status	Single	100	24.2
	Married	239	57.9
	Divorced	40	9.7
	Widowed	34	8.2
Religion	Orthodox	135	32.7
	Muslim	59	14.3
	Protestant	219	53
Ethnicity	Oromo	370	89.6
	Amhara	29	7
	Others*	14	3.4
Residence	Urban	241	58.4
	Rural	172	41.6
Educational status	Unable to read & write	124	30
	Primary school	89	21.5
	Secondary school	111	26.9
	College and above	89	21.5
Occupational status	Student	58	17
	Daily labor	65	15.7
	Farmer	121	29.3
	House wife	58	14
	Merchant	56	13.6
	Civil servant	55	13.3
Average monthly income (ETB)	≤1000	242	58.6
	1001-2000	56	13.6
	2001-3000	23	5.6
	3001-4000	20	4.8
	≥4001	72	17.4

Clinical characteristic of the study participants

Regarding the clinical characteristics of the study participants, nearly half, 198 (47.9%), were diagnosed with asthma between the ages of 25 and 49 years. Approximately 136 (32.9%) participants reported having asthma for a duration of 2 to 5 years. Additionally, about 170 (41.2%) participants had a family history of asthma. Among the participants, 161 (39%) had

co-morbid conditions, with 53 (12.8%) specifically diagnosed with hypertension. Approximately three-quarters of the participants, 286 (69.2%), experienced frequent asthma exacerbations in the past year. Less than half, 151 (36.6%), had been hospitalized in the last 12 months, with 42 (27.8%) of those admissions attributed to asthma. Furthermore, the majority of participants, 350 (84.7%), reported experiencing triggers related to seasonal variations. (Table 2).

Knowledge, attitude, and behavior characteristics of the study participants

Out of the participants, 112 (27.1%) reported having consumed alcohol at some point in their lives, with 57 (50.9%) of these individuals currently drinking alcohol. Additionally, 54 (12.1%) of participants were former cigarette smokers, and among them, 31 (57.4%) were currently smoking more than eleven cigarettes per day. Furthermore, a substantial majority, 348 (84.5%), engaged in regular physical exercise.

Regarding social support, half of the study participants, totaling 207 (50.1%), reported having no social support. Additionally, a significant portion of the participants experienced mental health challenges, with approximately 78.7% reporting anxiety and 54.7% indicating symptoms of depression. The study also found that 155 participants (37.5%) had poor knowledge about asthma self-care practices. Moreover, less than half of the participants, specifically 147 (35.6%), held negative attitudes toward asthma self-care practices. (Table 3).

Table 2: Clinical characteristics of adult asthmatic patients at public hospitals in East Wallaga zone receiving follow up OPD, West Ethiopia,2023 (n=413)

Variables	Categories	Frequency	Percent
Age at asthma diagnosis (year)	<25	166	40.2
	25-49	198	47.9
	≥50	49	11.9
Duration living with asthma (year)	<2	73	17.7
	2-5	136	32.9
	6-10	105	25.4
	11-20	70	16.9
	>20	29	7.0
Family history of asthma	Yes	170	41.2
	No	243	58.8
History of co-morbidity	Yes	161	39.0
	No	252	61.0
Types of co-morbidity	Heart failure	25	15.5
	Diabetes mellitus	29	18
	Renal disease	33	20.5
	Hypertension	53	33
	Others**	21	13
History of asthma exacerbation in the last 12 months	Yes	286	69.2
	No	127	30.8
History of admission to hospital in last 12 months	Yes	151	36.6
	No	262	63.4
If yes, cause of admission	Asthma	42	27.8
	Others***	109	72.2
Triggering factors can exacerbate asthma attack	Yes	350	84.7
	No	63	15.3

Table 3: Knowledge, attitude and behavioral characteristics of adult asthmatic patients at public hospitals in East Wallaga zone receiving follow up care OPD, West Ethiopia,2023(n=413)

Variables	Categories	Frequency	Percent
Are you ever drinker alcohol	Yes	112	27.1
	No	301	72.9
Are you currently drinking alcohol	Yes	57	50.9
	No	55	49.1
If yes, how many times a week	<2	20	35
	≥2	37	65
Are you ever smoker	Yes	54	13.1
	No	359	86.9
Are you currently cigarette smoke	Yes	31	57.4
	No	23	42.6
If yes, how many cigarettes do you smoke per day	<5	7	22.6
	5-10	6	19.4
	≥11	18	58
Have you doing regular physical exercise	Yes	349	84.5
	No	64	15.5
If yes, which physical exercise do you practice	Walking	316	90.6
	Gymnastic	13	3.7
	Running	20	5.7
Duration of doing physical exercise per day (in minute)	<30 minutes	193	46.7
	≥ 30 minutes	156	37.8
Social support	Have social support	206	49.9
	No social support	207	50.1
Anxiety	Normal	12	2.9
	Borderline	76	18.4

	Abnormal	325	78.7
Depression	Normal	97	23.5
	Borderline	90	21.8
	Abnormal	226	54.7
Knowledge	Poor knowledge	155	37.5
	Good knowledge	258	62.5
Attitude	Negative attitude	147	35.6
	Positive attitude	266	64.4

Proportion of asthma self-care practice

Among the 413 study participants, 213(51.6%) had asthma good self-care practice with 95% CI (46.7, 56.4) (Fig.2)

Factors associated with self-care practice

Bivariable logistic regression was employed to examine the relationship between each independent variable and the outcome variable (asthma self-care practice). Variables demonstrating an association with a p-value of less than 0.25 were subsequently included in the multivariable logistic regression model. In the binary logistic regression analysis, the following variables were identified as candidates for the multivariable model: residence, co-morbidity, family history of asthma, history of asthma exacerbation, seasonal variations, pests, past alcohol consumption, past cigarette smoking, social support, depression, and attitude, all with p-values below 0.25. The multivariable logistic regression analysis revealed that co-morbidity, past cigarette smoking, past alcohol consumption, and social support were significant predictors of self-care practices among asthmatic patients. Notably, the absence of co-morbidity was significantly associated with better self-care practices; participants without co-morbidities had higher odds of exhibiting good self-care practices compared to those with co-morbidities (AOR: 2.0, 95% CI: 1.26-3.10). Additionally, there was a significant correlation between never consuming alcohol and self-care practices. Participants who reported never drinking alcohol had greater odds of practicing good self-care compared to those who had consumed alcohol at any point (AOR: 4.33, 95% CI: 2.52-7.44). Similarly, individuals who had never smoked demonstrated a significant association with good self-care practices compared to those who had smoked; the odds of practicing good self-care were lower among those who reported ever smoking (AOR: 6.67, 95% CI: 2.46-18.1). Lastly, participants who

reported having social support also exhibited a significant association with good self-care practices. Those with social support had higher odds of engaging in good self-care compared to individuals lacking such support (AOR: 1.57, 95% CI: 1.00-2.48) (Table 4)

Discussion

This study was aimed to assess the magnitude of good self-care practice and associated factors among adult asthmatic patients on the follow-up care at public hospitals in East Wollega zone, West Ethiopia. The results indicated that over half (51.6%) of the participants demonstrated good asthma self-care practices in the study area. These findings are consistent with a study conducted in Bangladesh [18] and Taiwan [25] in which good asthma self-care practice was found to be 49.63% and 51.5% respectively. In contrast, this finding is lower than the 57.1% reported in a study conducted in Saudi Arabia.[14] The discrepancy in results may be attributed to variations in the health-related information provided, the study design (which utilized a mixed-method approach), and the availability of resources, health facilities and health education programs have enhanced patients' understanding of self-care. However, the study was limited by a small sample size of 125 participants, as well as the impact of lifestyle modifications and the socio-demographic characteristics of those involved on asthma self-care practices. Additionally, this finding was higher than those reported in studies conducted in the northern region of Ethiopia 42.3%, and Rwanda 33.8% respectively.[15,17]

In the northern region of Ethiopia, this discrepancy may be attributed to several factors, including the socio-demographic characteristics of the study participants, with 30.2% lacking formal education. Additionally, the study did not evaluate patients' attitudes toward asthma self-care practices, and it was conducted in a limited number of settings (only three hospitals). Furthermore, a significant portion of participants demonstrated poor knowledge of asthma self-care practices (41.5%), and there were prevalent socio-cultural habits among the participants, such as a 75.5% rate of alcohol consumption. In Rwanda, this discrepancy may be attributed to several behavioral factors, including a 45.5% rate of alcohol consumption among participants. Other contributing elements include the duration of the study, a limited sample size, and the fact that the research was conducted across only three health centers and one hospital. Furthermore, participants in the current study demonstrated a higher level of knowledge and a more positive attitude toward asthma self-care practices compared to findings from studies conducted in the northern region of Ethiopia and Rwanda respectively.[15,17]

Table 4: Bivariable and multivariable logistic regression analysis for factors associated with good self-care practice among patients with asthmatic receiving follow up-care OPD at public hospitals in East Wallaga zone, West Ethiopia, 2023(n=413)

Variables	Categories	Self-care practice		COR 95% CI	p-value	AOR 95% CI	p-value
		Good	Poor				
Residence	Urban	131	110	1.30(0.88-1.93)	0.18	1.02(0.64-1.62)	0.93
	Rural	82	90	1		1	
Family history of asthma	Yes	91	79	1			
	No	109	134	1.42(0.96-2.10)	0.08	1.24(0.79-1.95)	0.35
Co-morbidity	Yes	99	62	1		1	
	No	101	151	2.39(1.59-3.58)	0.01	**2(1.26-3.10) ***	0.03
History of asthma	Yes	147	139	1			
	No	53	74	1.48(0.97-2.25)	0.07	1.10(0.67-1.83)	0.70
Seasonal variations	Yes	176	174	1			
	No	24	39	1.64(.95-2.85)	0.08	1.56(0.83-2.93)	0.17
Pests	Yes	98	88	1			
	No	102	125	1.37(0.93-2.01)	0.12	1.26(0.79-2.00)	0.32
Ever Alcohol drank	Yes	88	24	1		1	
	No	112	189	6.19(3.72-10.29)	0.01	**4.33(2.52-7.44) ***	0.01
Ever Smoked	Yes	49	5	1		1	
	No	150	208	13.59(5.25-34.69)	0.01	**6.67(2.46-18.1) ***	0.01
Social support	Have social support	124	82	2.56(1.72-3.80)	0.01	**1.57(1.00-2.48) ***	0.04
	No social Support	77	130	1		1	
Depression	Normal	51	46	1.06(0.47-1.22)	0.25	1.06().57-1.77)	0.99
	Borderline	46	44	1.25(0.49-1.31)	0.37	0.79(0.45-1.40)	0.43
	Abnormal	103	123	1			
Attitude	Positive	122	144	0.75(1.24-1.99)	0.16	1.04(0.64-1.69)	0.87
	Negative	78	69	1		1	

Asthmatic patients with social support were found to be 1.57 times more likely to engage in good asthma self-care practices compared to those without social support. This suggests that having social support may enhance self-care behaviors, ultimately leading to improved self-care practices. These findings align with a study conducted in the northern region of Ethiopia, which indicated that asthmatic patients lacking social support were nearly twice as likely to exhibit poor self-care practices compared to their counterparts who had social support.[15] Another study conducted in the U.S. supports this finding, demonstrating that social support from family and friends is crucial for individuals with chronic illnesses, such as asthma. This support helps them develop a positive self-concept and self-esteem, which in turn fosters emotional and social backing for effective self-care practices. Specifically, it aids in medication adherence and ensures that patients have accompaniment to healthcare facilities on the day of their appointments.[24-25]

Asthmatic patients without comorbid illnesses were twice as likely to engage in effective asthma self-care practices compared to those with comorbid conditions. This indicates that the presence of comorbidities is associated with a higher likelihood of inadequate self-care among participants. These findings align with a study conducted in the northern region of Ethiopia, which found that asthmatic individuals with comorbid illnesses were nearly twice as likely to exhibit poor self-care practices compared to those without any comorbid conditions.[15] Comorbid illnesses can exacerbate a patient's condition, hindering their ability to adhere to self-care practices. This complexity complicates the diagnosis and management process, potentially resulting in misdiagnosis, under-treatment, or over-treatment.[26]

Asthmatic patients who did not smoke cigarettes were 6.67 times more likely to demonstrate effective asthma self-care practices compared to those who did smoke. This indicates that a history of smoking is linked to a higher likelihood of poor self-care behaviors, which can damage the lungs and alveoli. Notably, individuals who smoke more than 11 cigarettes per day seem to be particularly at risk for exacerbating their asthma symptoms.[27]

The Global Initiative for Asthma Strategy 2021 emphasizes that abstaining from smoking is an important self-care practice for individuals with asthma. Smoking can significantly exacerbate asthma symptoms and lead to more severe health complications. By choosing to refrain from smoking, patients are actively managing their health and taking proactive steps to enhance their respiratory function and overall well-being.[28]

Another study found in Taiwan supports this finding; patients with no smoking history who quit smoking have better self-care practices than those who continue to smoking.[25] Cigarette smoking is linked to a faster decline in lung function, greater reliance on health services, and heightened severity of asthma symptoms. This highlights how quitting smoking can enhance lung function in adult asthmatic patients. However, it is important to note that asthmatic individuals who smoke may exhibit poor self-care practices.[29]

Asthmatic patients who abstained from alcohol were 4.33 times more likely to demonstrate good self-care practices compared to those who consumed alcohol. This suggests that individuals with a history of alcohol consumption tend to engage in poorer self-care. This finding aligns with a study conducted in northern Ethiopia, which found that asthmatic patients who drank alcohol were nearly twice as likely to adopt poor self-care practices compared to their non-drinking counterparts.[15] Additionally, alcohol consumption can harm the lungs and trigger asthma exacerbations. Consequently, asthmatic patients who drink may neglect their medications and demonstrate decreased self-care practices.[17] Consuming alcohol, particularly wine, seems to be a significant trigger for asthma exacerbations, leading to alcohol-induced asthma. This condition results in pathological bronchoconstriction, impacting many individuals with asthma.[30]

Strengths and limitations

The current study has several strengths. It utilized a structured questionnaire to collect comprehensive information on self-care practices and related factors among asthmatic patients, resulting in a strong dataset for analysis. The use of face-to-face interviews contributed to a 100% response rate. Additionally, the research was conducted across all hospitals in the East Wollega zone, enhancing its multi-center approach. However, there are notable limitations. Firstly, the cross-sectional design of the study prevents the establishment of causal relationships between asthma self-care practices and associated factors. Secondly, self-reported data on asthma self-care practices may lead to biases, potentially inflating or deflating reported practices. Thirdly, participants might struggle to accurately recall their self-care practices, introducing inaccuracies and bias in reporting. Lastly, the findings may not be applicable to all asthmatic patients in Ethiopia or other regions, as the sample was drawn from a specific zone with distinct socio-cultural characteristics.

Conclusion

The study found that just over half of the asthmatic patients in the area demonstrated good self-care practices. This indicates that a considerable number of asthmatic patients may not be fully

adhering to the recommended self-care behaviors. Furthermore, the research identified several significant factors associated with good self-care practices among these patients, including the absence of comorbid conditions, a history of never consuming alcohol, being a non-smoker, and having robust social support.

Implications of the finding

Our findings highlight that asthma poses a significant health challenge in the East Wollega zone. These findings underscore the importance of asthma as a public health issue in the zone and highlight the need for public hospitals and hospital management to prioritize interventions promoting behavioral changes, to empower patients to practice better self-care and strengthening self-care practices, particularly by addressing modifiable triggers are needed

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Availability of data and materials: The datasets utilized or analyzed during the current study are available from the corresponding author upon reasonable request. All the supplemental information was included.

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Figure legends

Figure 1: Schematic presentation of proportional allocation of the sample size for each public hospital in East Wollega Zone, West Ethiopia, 2023

Figure 2. Self-care practices of adult asthmatic patients at public hospitals in East Wallaga zone receiving follow up care OPD, West Ethiopia,2023

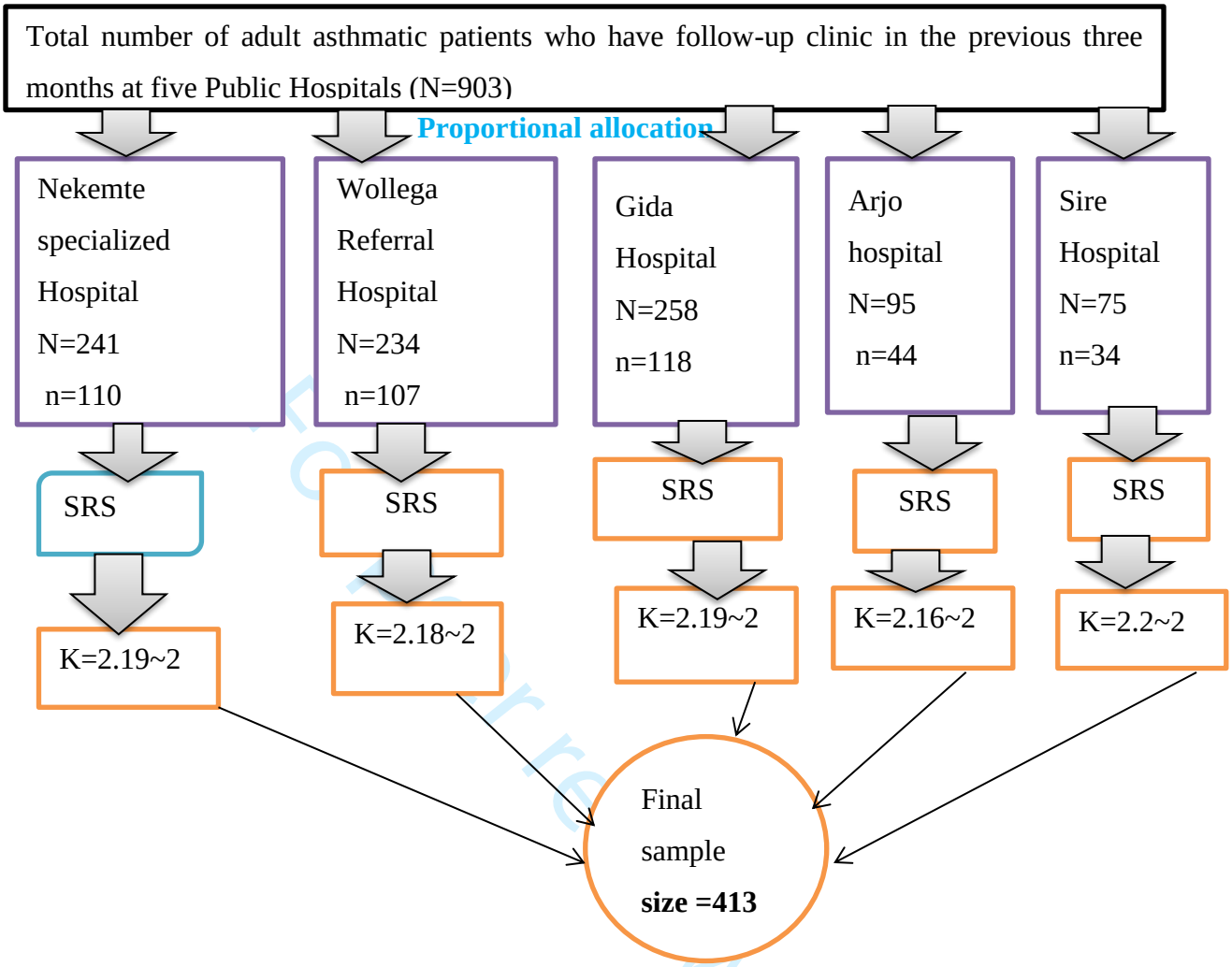

Figure 1: Schematic presentation of proportional allocation of the sample size for each public hospital in East Wollega Zone, West Ethiopia, 2023

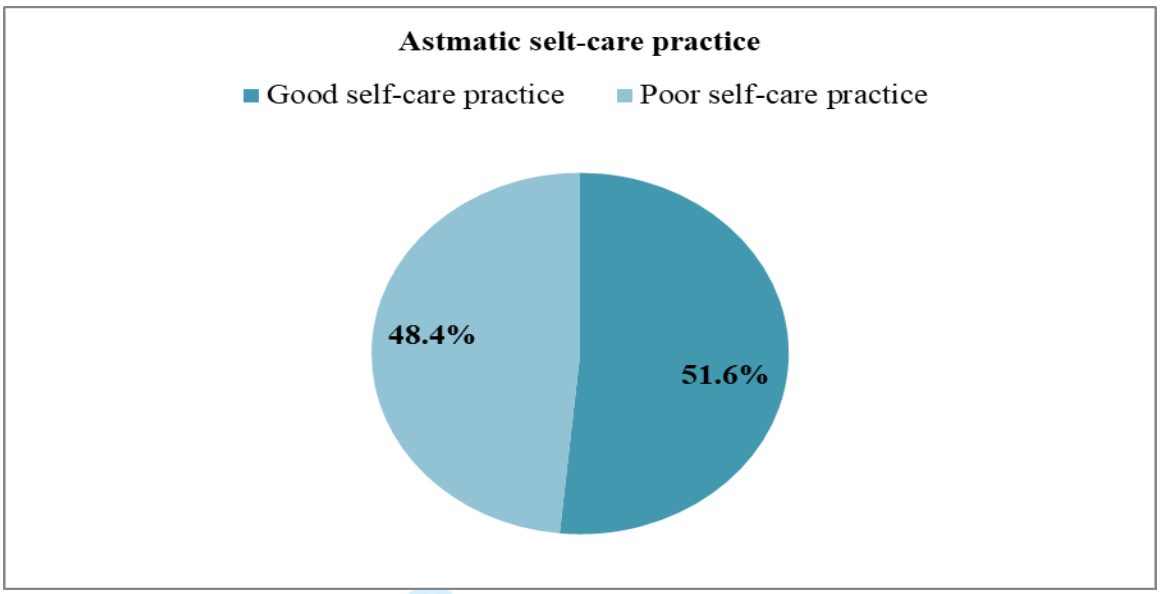

Figure 2. Self-care practices of adult asthmatic patients at public hospitals in East Wallaga zone receiving follow up care OPD, West Ethiopia,2023

ANNEX I

ENGLISH VERSION QUESTIONNAIRE

General instruction

1. For multiple choice questions circle to the number which contains your correct answer (the most appropriate answer) in the space provided.
2. If your answer is not listed among alternatives, please tell your own answer for the data collector

Part I: Socio demographic and health status data

Date: _____Code_____

Q/N	Questions	Response
101	How old are you?	_____years
102	Sex?	1. Male 2. Female
103	What is your marital status?	1. Single 2. Married 3.Divorced 4. Widowed
104	Residence?	1. Urban 2. Rural
105	Ethnicity?	1. Oromo 2. Amhara 3. Tigray 4. Other(specify)____
106	What is your religion?	1.Orthodox 2. Muslim 3.Protestant 4. Others(specify) ----------
107	What is your educational status?	1. Unable to read and write 2. Primary school 3. Secondary school 4. College and above
108	What is your occupation?	1. Student 2. Daily laborers 3. Farmer 4. House wife 5. Merchant 6. Civil servant 7. Other (specify)_____
109	Income (average monthly income)	_____Ethiopia birr

Part II. Clinical characteristics related factor

No	Questions	Response
301	Age at which the asthma occurred (in years)	_____years
302	Duration of Asthma since diagnosis	_____years
303	Family Hx of asthma	1. Yes 2. No
304	Do you have any Co-morbidity?	1. Yes 2. No
305	If yes to question No 304, which one?	1. Chronic heart failure 2. Diabetes mellitus 3. Renal disease 4. Chronic liver disease 5. Hypertension 6. Other (specify)----------
306	History of asthma exacerbation in last 12 months	1. Yes 2. No
307	Have you been admitted in the hospital within the past 12 months	1. Yes 2. No
308	If your answer is yes for the above question No 307, what was the cause for admission	1. Asthma 2. Others
309	Triggering factors (you can select more than one option)	1. Seasonal variations 2. Dusts3. Pets 4.Stressful events 5. Pollens 6. Physical exercise 7. Molds 8. Emotions 9. Smoke 10. Others(specify)_____

Part III. Behavioral and Psychological related factor

A. Questionnaires to assess factors of behavioral habit

Q/N	Questions	Response	Skip
501	Are you ever drinker alcohol?	1. Yes 2. No ----------	504
502	Are you currently drinking alcohol?	1. Yes 2. No ----------	504
503	If**Q502 is yes**, how many times a week?	_____	
504	Are you ever smoker?	1. Yes 2.No ----------	507
505	Are you currently smoking?	1. Yes 2. No----------	507
506	If **Q505 yes**, how many cigarettes do you smoke per day	_____	
507	Have you doing regular physical exercise	1. Yes 2. No----------	601
508	If **Q507 yes**, which physical exercise do you practice	1. Waking 2. Gymnastic 3. Running 4. Other(specify)---	
509	For how much minute per day	_____ minute	

B. **Psychological factor: Multidimensional Scale of Perceived Social Support**

Q/N	**Social support questions**	V/Strongly disagree	Strongly disagree	Neutral	Strongly agree	Very Strongly
		1	2	3	4	5
601	There is a special person who is around when I am in need					
602	There is a special person with whom I can share joys and sorrows.					
603	My family really tries to help me.					
604	I get the emotional help & support I need from my family.					
605	I have a special person who is a real source of comfort to me					
606	My friends really try to help me.					
607	I can count on my friends when things go wrong.					
608	I can talk about my problems with my family.					
609	I have friends with whom I can share my joys and sorrows					
610	There is a special person in my life who cares about my feelings.					
611	My family is willing to help me make decisions					
612	I can talk about my problems with my friends.					

C. Anxiety and Depression Scale HADS Questionnaires

Please check you have answered all the questions Scoring: Depression (D) , and Anxiety (A) _____ 0-7 = Normal, 8-10 = Borderline abnormal (borderline case), 11-21 = Abnormal (case) Total score:					
D	**A**		**D**	**A**	
701		I feel tense or 'wound up':		708	I feel as if I am slowed down
	3	Most of the time	0		Nearly all the time
	2	A lot of the time	1		Very often
	1	From time to time, occasionally	2		Sometimes
	0	Not at all	3		Not at all
702		I still enjoy the things I used to enjoy:		709	I get a sort of frightened feeling like 'butterflies' in the stomach:
0		Definitely as much		3	Not at all
1		Not quite so much		2	Occasionally
2		Only a little		1	Quite Often
3		Hardly at all		0	Very Often
703		I get a sort of frightened feeling as if something awful is about to happen:		710	I have lost interest in my appearance:
	3	Very definitely and quite badly	0		Definitely
	2	Yes, but not too badly	1		I don't take as much care as I should
	1	A little, but it doesn't worry me	2		I may not take quite as much care
	0	Not at all	3		I take just as much care as ever
704		I can laugh and see the funny side of things:		711	I feel restless as I have to be on the move:
0		As much as I always could		3	Very much indeed
1		Not quite so much now		2	Quite a lot
2		Definitely not so much now		1	Not very much
3		Not at all		0	Not at all
705		Worrying thoughts go through my mind:		712	I look forward with enjoyment to things:
	3	A great deal of the time	0		As much as I ever did
	2	A lot of the time	1		Rather less than I used to
	1	From time to time, but not too often	2		Definitely less than I used to

	0	Only occasionally	3		Hardly at all
706		I feel cheerful:		713	I get sudden feelings of panic:
0		Not at all		3	Very often indeed
1		Not often		2	Quite often
2		Sometimes		1	Not very often
3		Most of the time		0	Not at all
707		I can sit at ease and feel relaxed:		714	I can enjoy a good book or radio or TV program:
	3	Definitely	0		Often
	2	Usually	1		Sometimes
	1	Not Often	2		Not often
	0	Not at all	3		Very seldom

D. Knowledge of Asthma self-management questionnaire

Assign one point for each preferred response sum all pointes to generate the row score range from 0-16. Transform the row score to range from 0-100 transform score= (raw score/16) *100 report the transformed score higher score indicates more knowledge of asthma self-management			
801	A main method of prevent asthma flare-ups is to--	805	The correct way to use of a peak flow meter is to
	A. Take medicine before meals B. Take steroid in pill form C. Get a flu vaccine D. Go to emergency room at the first sign of symptom E. I don't know		A. Take deep breath and then blow in to mouth piece slowly B. Start exhaling and then put the mouth piece in your mouth C Put the mouth piece in your mouth and then inhale and exhale D. Take deep breath and then blow in to mouth piece as fast as you can E. I don't know
802	Taking prescribed two puff of your inhaler two times per day	806	Rescue medications
	A. Is the same taking one puff four times day B. Is the same taking four puff once day C. can be arrange in away as long as you four times a day D. Is not the same as any other region E. I don't know		A. Should not be taken more than three or four times per day B. Help prevent future flare ups C. Have no side effects D. Don't cause you become tolerant to medicine E. I don't know
803	If you are not having symptom of asthma	807	When use your inhaler you should
	A. Your lung is not sensitive to irritant B. It is ok to skip same dose of medicine		A. Take shallow breaths B. Inhale quickly C. Inhale slowly

	C. You should still avoid triggers D. You are probably of cured asthma E. I don't know		D. Press your inhaler several times while you are inhaling E. I don't know
804	Maintenance medicines	808	After you have used your inhaler you should
	A. help prevent feature symptom B. do not to be taken every day C. make your breath better right after you take them D. can only be taken in pill form E. I don't know		A. hold your breath for several B. Take the second puff as soon as possible after the first puff C. keep taking puff until you feel better D. wash the inhaler in the tube of water E. I don't know
809	If you are having symptom don't know why	813	Asthma can be cured by
	A. Some dose of steroid medication B. Call your doctor C. Count how fast you are breathing D. Change your immediate environment E. I don't know		A. Taking daily medicine B. Avoid trigger such as dust and cigarette smoking C. Using a peak flow meter D. There is no known for cure asthma E. I don't know
810	Taking more rescue medication prescribe	814	Asthma flair up
	A. Is really not harm full B. Is good way managing a symptom C. May mean you can take less maintenance medicine D. May mean you need more maintenance medicine E. I don't know		A. Usually occur suddenly with out B. Can occur when several minor triggers come to gather C. Cannot be triggered by strong emotion D. Always cause wheezing E. I don't know
811	The benefit of using a peak flow meter every day is	815	If you are prescribed a seven-day course of steroid pills

	A. You can detect small change B. It can tell you when you can decrease your medicine C. You can see how well you can inhale D. You can have a way to compare yourself to other people E. I don't know		A. You don't have to avoid triggers while you are taking the pills B. Your symptom can't get worse while you are taking the pill C. You don't need to use your peak flow meter while you are taking the pills D. You should finish the proscription even if you feel better after several dose E. I don't know
812	For people with asthma exercise	816	Which of the following can help control asthma
	A. Is something that should not be done B. Can help improve breathing capacity C. Is only good if done 30 minutes at a time D. Can trigger symptom because the lung are not taking in enough oxygen E. I don't know		A. Reduce stress level B. Drinking plenty of water to stay hydrated C. Avoid foods with sulfates, such as dried fruits and wine D. All of the above E. I don't know

E: Questions to assess the participant's attitude toward asthma

Instruction: Read each statement carefully and put 1 for strongly disagree, 2 for disagree, 3 for neutral, 4 for agree and 5 for strongly agree in the corresponding column that most likely reflects the respondents answer to the following questions

S/N	Questions	Strongly disagreed	Disagree	Neutral	Agree	Strongly agree
901	Following a healthy diet and life style will help control your asthma					
902	It is important for you to take your asthma medications as prescribed					
903	Your family can help you to remain calm during your asthma episode					
904	You can learn to be an effective asthma self-manager.					
905	The more you know about asthma, the more you can help your self					

Part IV: Self-care practice questionnaire

The Asthmatic Self-care Practice Questionnaire a four-point Likert scale ranged from 1 to 4; 4= always perform, 3= frequent perform, 2= sometimes perform, and 1=never perform. The score of Asthmatic Self-Care Practice Questionnaire calculated from summing the total score ranged from 9 to 32.					
Q/N	**Self-care practice**	Always perform	Frequent perform	Sometimes perform	Never perform
201	Do you smoke cigarette				
202	Do you live with a person who smoke cigarette				
203	Avoid contact with furry animals (e.g., cats, dogs)				
204	Reduce pollen exposure				
205	Reduce exposure to house dust mite				
206	Avoid sensitizers and irritants (dust and fumes) which aggravate or cause asthma especially in the workplace				
207	Avoid food and beverages containing preservatives				
208	Avoid drugs that aggravate asthma such as beta-blockers and aspirin and non-steroidal anti-inflammatory drugs				

Thank you for your participation

ANNEX II.

WARRAAQSA ODEEFFANNOO AFAAN OROMOON

Kutaa I: Odeeffannoo hawaasa-dimoogiraafii fi haala fayyaa isaanii

Guyyaa: _____ kooddii_____		
Lak	**Gaaffiileee**	**Deebiii gaaffilee**
101	Umriin kee meeqa?	_____waggaa
102	Saalaa?	1. Dhiira 2. Dhalaa
103	Haalli gaa'ela keessanii akkamii?	1. Hin fuune/hin heerrumne 2. Fudheera/heerumeera 3. Hiikeen jira 4. Naa irra du'e/tte
104	Bakka jireenyaa keessan ?	1. Magaala 2.Baadiyyaa
105	Sabummaan keessan?	1. Oromoo 2. Amaharaa 3.Tigiree 4.kan biroo (ibsi)_____
106	Amantiin kee maalii?	1.Orthodoksii 2.Muslima 3.Protestaantii 4.Kan biroo(ibsi) ----------
107	Haalli barnootaa keessan akkami?	1. Dubbisuu fi barreessuu hin danda'u 2.M/B/sadarkaa 1ffaa 3. M/B/sadarkaa 2ffaa 4. Kolleejjii fi isaa ol
108	Hojiin kee maali?	1. Barataa 2. Hojjetoota guyyaa guyyaa 3. Qotee bulaa 4. Hojii Manaa keessan hojjedha 5. Daldalaa 6.Hojjetaa mootummaa 7. Kan biroo (ibsi)_____
109	Galii giddugaleessa ji'aatti argattan meeqa ta'a	_____ birri Itoophiyaan

Kutaa II: Gaaffii shaakala kunuunsa asmii ofiif taasisaan

4= yeroo hunda raawwachuu, **3**= yeroo baay'ee raawwachuu, **2**= yeroo tokko tokko raawwachuu, fi **1**=gonkumaa raawwachuu dhiisuu.					
	Shaakala of kunuunsuu	**4**	**3**	**2**	**1**
201	Sigaaraa ni xuuxaa?				
202	Nama sigaaraa xuuxu waliin nijiraattaa?				
203	Bineensota rifeensa qaban (fkn ,saree ,aduree) waliin wal tuttuqqaa gochuu irraa of qusattaa?				
204	Saaxilamuu pooleenii (kakkaastuu) ni hir'istaa?				
205	Saaxilamummaa dafqa manaa ni hir'istaa?				
206	Keessattuu bakka hojiitti wantoota miira namaa kakaasan fi nama aarsan, gaasii dhukkuba asmii hammeessan ykn fidan irraa ni fagaattaa?				
207	Nyaataa fi dhugaatii wantoota nyaata ittisan of keessaa qaban irraa ni fagaattaa?				
208	Qorichoota dhukkuba asmii hammeessan kanneen akka beta-blockers (copha ijaa dabalatee), fi aspirin fi non-steroidal irraa of ni fageessitaa?				

Kutaa III. Amaloota mana yaalaa wajjin walqabatee

Lakk	Gaaffiiee	Deebii
301	Umurii meeqatti dhukkubni asmii si qabee	_____waggaadhan
302	Dhukkuba Asmii qabachuu kee erga adda ba'ee hangaam ta'eera?	_____Waggaadhan
303	Maatii seenaa dhukkuba asmii qabu qabdaa?	2. Eyyee 2. Lakkii
304	Dhukkuba qancarroo asmii waliin walittii dhufeenya qaban qabda(Co-morbidity)?	1. Eyyee 2. Lakkii
305	Gaaffii Lakk 304 irratti eeyyee yoo ta'e isa kam?	**1**. Dadhabbii onnee yeroo dheeraa 2. Dhukkuba sukkaaraa 3. Dhukkuba kalee 4. Dhukkuba tiruu 5. Dhiibbaa dhiigaa 6. Kan biroo (ibsi)_____
306	Ji'oota 12 darban keessatti dhukkubni asmii sitti hammacha tureeraa?	2. Eyyeen 3. Lakkii
307	Ji'oota 12 darban keessatti hospitaala ciiftee beektaa?	2. Eyyeen 2. Lakkii
308	Gaaffii lakk 307, kanaaf deebiin kee eeyyee yoo ta'e sababni ati ciifteef maali ture?	2. Asmii 2. Kanneen biroo
309	Wantoota asmii natti kakaasan jettee yaadduu filadhu. Deebbii tokkoo of filachuu ni dandeessa	2. Jijjiirama waqtiilee 2. Dafqa manaa 3. Bineensota manaa 4. Taateewwan dhiphina 5.Pollenii garagaraa 6. Sochii qaama taasisuu 7. Suphee/lafa 8. Miira aarii 9. Sigaaraa aarsuu 10. Kan bieoo(ibsi)_____

Kutaa IV. Qabxii amala waliin walqabatu

Gaaffiiwwan sababoota amala madaaluuf nu gargaaran

Lak	Gaaffiilee	Deebii	Darbii
501	Alkoolii dhugdee beektaa?	1. Eyyee 2. Lakkii ----------	504
502	Yeroo ammaa kana dhugaatii alkoolii ni dhugduu?	1. Eyyee 2. Lakkii----------	504
503	Yoo **gaaffiin 502 eeyyee** ta'e torbanitti yeroo meeqa dhugduu?	_____	
504	Tamboo xuuxxee beektaa?	1. Eyyee 2.Lakkii ----------	507
505	Yeroo ammaa kana tamboo xuuxaa jirtaa?	1. Eyyee 2. Lakkii----------	507
506	Yoo **gaaffiin 505 eeyyee** ta'e guyyaatti sigaaraa meeqa xuuxa?	_____	
507	Sochii qaamaa yeroo hunda ni taasistaa?	1. Eyyee 2. Lakkii----------	601
508	Yoo gaaffiin **507 eeyyee** ta e sochii qaamaa akkamii taasisaa jirtaa?	1. Miilaan deemuu 2. Jiimnaastikii 3. Fiigicha 4. Kan biroo (ibsi)__	
509	Guyyaatti daqiiqaa meeqaf sochii qaamaa taasiftaa?	_____ daqiiqaa	

Kutaa V: Qabxii xiinsammuu

I. Gaaffilee Qajeelfama deeggarsa hawaasummaa nama hubamef taasifaamu qabu 1= Baayee cimsee irratti walii hin galu, **2**= Cimsee irratti walii hin galu, **3**= Giddu galeessa , **4**= ciimsee irratti waliin gala, fi **5**= Baay'ee cimsee irratti waliin galla

Lak	Gaaffilee	1	2	3	4	5
601	Namni addaa yeroo rakkattuu naannoo kee jira?					
602	Namni addaa gammachuu fi gadda waliin qooddachuu dandeessu jiraa					
603	Maatiin kee dhuguma si gargaaruuf yaalu.					
604	Gargaarsa miiraa fi deeggarsa si barbaachisu maatii kee irraa ni argattaa					
605	Nama addaa madda jajjabina dhugaa sif ta'e qabda.					
606	Hiriyoonni kee dhuguma ni gargaaruuf yaalu.					
607	Yeroo wanti tokko dogoggora ta'u hiriyyoota keetti himachuu ni dandeessa.					
608	Waa'ee rakkoo kee maatii kee wajjin haasa'uu ni dandeessa					
609	Hiriyyoota gammachuu fi gadda kee waliin qooddattu qabda					
610	Jireenya kee keessatti namni addaa miira keetiif dhimmamutu jira.					
611	Maatiin kee murtoo akka godhattu si gargaaruuf fedhii qabu					
612	Rakkoo kee hiriyoota kee wajjin haasa'uu ni dandeessa.					

II. Gaaffilee Iskeelii Yaaddoo fi Dhiphina safaraan

Qabxii: Dhiphina sammuu (D) _____ Yaaddoo (A) _____ .					
D	A		D	A	
701		Dhiphinni ykn 'madaa'ee' sitti ni dhaga'ama:		708	Akka waan saffisa koo hir'iseetti natti dhaga'ama
	3	Yeroo hunda	0		Yeroo hunda jechuun ni danda'ama
	2	Yeroo baayyee	1		Yeroo baayyee
	1	Darbee darbee	2		Yeroo tokko tokko
	0	Gonkumaa miti	3		Gonkumaa miti
702		Ammas wantoota duraan itti gammadutti nan gammada:		709	Garaa keessatti miira sodaa akka ''billaachatu'' natti dhagahama:
0		Baay'ee tti		3	Gonkumaa
1		Baay'ees miti		2	Yeroo tokko tokko
2		Xiqqoo qofa		1	Yeroo Baay'ee
3		Tasumaa rakkisaadha		0	Yeroo hundaa
703		Miira sodaa akka wanti hamaan tokko ta'uuf jedhutti natti dhaga'ama:		710	Bifa kootiif fedhii dhabeera:
	3	Baayyee hamaatu natti dhaga'ama	0		Dhugaadha
	2	Garuu baay'ee hamaa miti	1		Hanga of eeggannoo gochuu qabu hin godhu
	1	Xiqqoo, garuu na hin yaaddessu	2		Ani hamma tokko of eeggannoo nan godha
	0	Tasumaa iyyuu	3		Akkuma yeroo kaanii of eeggannoo nan godha
704		Wantootaan argutti kolfee qoosuu nan danda'a:		711	Sochii irra waanan jiruuf, boqonnaa dhabuun natti dhagahama:
0		Yeroo hundumaa		3	Baayyee dhuguma
1		Amma baay'ee miti		2	Baay'ee baay'eedha
2		Baayee xiqqoo dha		1	Baay'ee miti
3		Gonkuma iyyuu		0	Gonkumaa

705		Yaadonni na yaaddessaa ta'an sammuu keessa darbu:		712	Wantoota tokko tokko gammachuu fi hawwii guddaanin eeggadha:
	3	Yeroo hunduma	0		Akkuma yeroo kamiyyuu godhe
	2	Yeroo baay'ee	1		Kan duraan ture caalaa xiqqaadha
	1	Yeroo yerootti	2		Kan duraan ture irraa baayee xiqqaa dha
	0	Darbee darbee qofa	3		Tasumaa rakkisaadha
706		Gammachuun natti dhagahama:		713	Miira rifachuun akka tasaa natti dhagahama:
0		Tasumaa iyyuu		3	Yeroo baayyee dhuguma
1		Yeroo baay’ee miti		2	Yeroo baay’ee
2		Yeroo tokko tokko		1	Yeroo baayyee miti
3		Yeroo baay’ee		0	Tasumaa iyyuu
707		Tasgabbaa’ee taa’ee boqonnaan natti dhaga’amuu ni danda’a:		714	Kitaaba ykn sagantaa raadiyoo ykn TV gaarii ta’e tokkotti gammaduu nan danda’a:
	3	Dhugaadha	0		Yeroo baayyee
	2	Yeroo baay’ee	1		Yeroo tokko tokko
	1	Yeroo muraasa	2		Yeroo baay’ee miti
	0	Tasumaa iyyuu	3		Gonkuma iyyuu

Kutaa VI. Gaaffii of bulchuu beekumsa Asmii

Maaloo deebbii gaaffilee keessan wajjin kan walsimutti maruun filadha

801	Malli guddaan dhukkuba asmii ittisuuf gargaaru isaa kamii?	805	Karaan sirrii itti fayyadama safartuu yaa'a olka'aa (peak flow meter) kamii
	A. Nyaata nyaachuu dura qoricha fudhachuu B. Istirooyidii bifa kiniiniitiin fudhachuu C. Talaallii infuleenzaa argachuu D. Mallattoo jalqabaa irratti gara kutaa yaalaa hatattamaa deemuu E. Ani hin beeku		A. Hafuura dheeraa baafadhuu achiis suuta suutaan gara afaanitti afuufi B. Hafuura baafachuu jalqabi achiis afaan kee keessa kaa'i C Qaama afaanii afaan kee keessa kaa'i achiis afuura baafachuu fi hafuura baafachuu D. Hafuura dheeraa baafadhu sana booda hamma dandeessutti saffisaan gara afaanitti afuufi E. Ani hin beeku
802	Guyyaatti al lama meeshaa inhaler kee lama kan ajajame fudhachuu	806	Qorichoota baraarsaa kee:
	A. Guyyaatti si'a afur puff tokko fudhachuun walfakkaataadha B. Guyyaa tokko al tokko puff afur fudhachuun wal fakkaataadha C. Guyyaatti si'a afur hanga siif ta'utti fagootti qopheessuun ni danda'ama D. Naannoo biraa wajjin tokko miti E. Ani hin beeku		A. Guyyaatti yeroo sadii ykn afur ol fudhatamuu hin qabu B. Fuulduratti akka hin mul'anne gargaaruu C. Miidhaa cinaa hin qaban D. Qoricha akka obsa qabdu hin godhin E. Ani hin beeku
803	Yoo hin beekne mallattoo dhukkuba asmii qabaachuu kee	807	Yeroo inhaler kee fayyadamtu maal gochuu qabda?
	A. Sombi kee wantoota asmii kakasaniif carraa saaxilamuu hin qabu B. Qoricha doosiin wal fakkaatu dhabuu ni dandeessaa C. Kakaastoota dhibee asmii irraa fagaachuu qabda		A. Hafuura gadi fagoo fudhachuu B. Dafii afuura baafachuu C. Suuta suutaan afuura baafachuu D. Yeroo afuura baafachaa jirtutti meeshaa afuura baafachuu kee yeroo hedduu dhiibaa E. Ani hin beeku

	D. Dhukkuba asmiirra fayyaa taateetta E. Ani hin beeku		
804	Qorichoota suphaa(maintenance) ta'an	808	808. Erga inhaler kee fayyadamtee booda fayyadamuu maal gochuu qabda
	A. Mallattoo amala ittisuuf gargaara B. Guyyaa guyyaan akka hin fudhatamne C. Erga isaan fudhattee booda afuura kee fooyyessuu D. Bifa kiniinii qofaan fudhatamuu danda'a E. Ani hin beeku		A. Yeoo hedduudhaaf hafuura kee qabadhu B. Puff isa jalqabaa booda daftee puff lammaffaa fudhachuu C. Hanga miira gaarii sitti dhagahamutti puff fudhachuu itti fufi D. Inhaler tuubii bishaanii keessatti dhiqachuu E. Ani hin beeku
809	Yoo mallattoon Asmii si mudate garuu maaliif akka ta'e hin beektu ta'e	813	813 Dhukkuba Asmii fayyuu kan danda'u kamii?
	A. Qoricha isteeroyidii doosii tokko tokko fudhachuu B. Doktora keef bilbililu C. Saffisaan akka hafuura baafachaa jirtu lakkaaftaa D. Naannoo dhiyoo kee jijjiirtaa		A. Qoricha guyyaa guyyaan fudhachuu B. Trigger kan akka dafqa fi sigaaraa xuuxuu irraa fagaachuu C. Safartuu yaa'a olka'aa fayyadamuu D. Dhukkuba asmii kan fayyisuun beekamu hin jiru E. Ani hin beeku
810	Qoricha baraarsaa(rescuer) dabalataa fudhachuu ajaja:	814	Asmiin akkamitti namatti ka'a
	A. Guutummaatti miidhaa guutuu hin fidu B. Mallattoo tokko to'achuuf karaa gaarii dha C. Qoricha suphaa xiqqaa fudhachuu dandeessa jechuu ta'uu danda'a D. Qoricha suphaa dabalataa si barbaachisa jechuu ta'uu danda'a		A. Yeroo baayyee waan tokko malee akka tasaa uumama B. Yeroo kakaastuun xixiqqoo hedduuminan walitti qabaman uumamuu danda'a C. Miira cimaadhaan kakaafamuu hin danda'u D. Yeroo hunda 'wheezing' namatti fida E. Ani hin beeku

811	Faayidaan safartuu yaa'a olka'aa guyyaa guyyaan fayyadamuu	815	Yoo kiniinii isteeroyidii guyyoota torbaaf siif ajajame:
	A. Jijjiirama xiqqaa adda baasuu dandeessa B. Yoom qoricha kee hir'isuu akka dandeessu sitti himuu danda'a C. Hammam akka gaariitti hafuura baafachuu akka dandeessu arguu dandeessa D. Namoota biroo wajjin karaa itti of madaaltu qabaachuu dandeessa E. Ani hin beeku		A. Yeroo kiniinii fudhattu triggers irraa fagaachuu hin qabdu B. Yeroo kiniinii fudhattu mallattoon kee hammachuu hin danda'u C. Yeroo kiniinii fudhattu safartuu dhangala'aa olka'aa kee fayyadamuun si hin barbaachisu D. Qoricha yeroo dheeraaf fudhattee fooyyee yoo argatteyyuu doosii sana xumuruu qabda E. Ani hin beeku
812	Namoota dhukkuba asmii qabaniif sochii qaamaa:	816	Kanneen armaan gadii keessaa kamtu dhukkuba asmii to'achuuf gargaaruu danda'a?
	A. Waan hojjetamuu hin qabneedha B. Dandeettii hafuura baafachuu fooyyessuuf gargaaruu danda'a C. Yeroo tokkotti daqiiqaa 30 yoo hojjetame qofa gaarii dha D. Somba oksijiinii gahaa waan hin fudhanneef mallattoo kaasuu danda'a E. Ani hin beeku		A. Sadarkaa dhiphina hir'isuu B. Bishaan baay'ee dhuguun bishaan qaama keessaa akka hin dhumnee gochuu C. Nyaata salfeet qabu kan akka fuduraalee goggogaa fi wayinii irraa fagaachuu D. Hunduu deebii dha E. Ani hin beeku

Kutaa VII: Gaaffiiwwan ilaalcha dhukkubsataan dhukkuba asmii irratti qabu

Qajeelfama: Tokkoo tokkoo hima armaan gadii sirriitti dubbisiitii Likert iskeelii qabxii afur qabu 1 hanga 4 gidduutti ture filadhu; **1**= Cimsee walii hin galle, **2**= Walii hin galle, **3**= Giddu galeessa, **4**=Waliin gala, fi **5**= Baayisee cimseen walii gala.

Lak	Gaaffilee	1	2	3	4	5
901	Nyaata fayya qabeessaa fi akkaataa jireenyaa hordofuun dhukkuba asmii kee to'achuuf ni gargaara					
902	Qorichoota asmii keessan akka ajajametti fudhachuun keessan barbaachisaadha					
903	Maatiin kee yeroo dhukkubni asmii sitti dhaga'amu tasgabbii akka qabaattu si gargaaruu danda'u					
904	Of bulchuu asmii bu'a qabeessa ta'uu isa hubachuu ni dandeessa.					
905	Waa'ee dhukkuba asmii hamma beektutti of gargaaruu dandeessa					

Hirmaannaa keessaniif galatoomaa

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SELF-CARE PRACTICE AND ASSOCIATED FACTORS AMONG ADULT ASTHMATIC PATIENTS ON FOLLOW UP-CARE AT PUBLIC HOSPITALS IN EAST WALLAGA ZONE, WEST ETHIOPIA: A CROSS-SECTIONAL STUDY, 2025

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Abstract

Objectives: This study aimed to assess self-care practices and the factors associated with them among adult asthmatic patients receiving follow-up care at public hospitals in the East Wallaga Zone of West Ethiopia in 2023

Design: A cross-sectional study conducted in an institutional setting

Setting: The research was carried out in government hospitals, including two primary hospitals, one general hospital, and two comprehensive specialized hospitals, from May 29 to July 29, 2023

Participants: A systematic random sample of 413 adult asthmatic patients undergoing follow-up care at public hospitals in the East Wallaga zone was selected. Data were collected using a structured, self-administered questionnaire, which was then entered into Epidata version 4.6 and analyzed using SPSS version 27.

Outcome measures: The primary outcome measure was the classification of asthma self-care practices as either good or poor

Results: The findings revealed that 51.6% (95% CI: 46.7% to 56.4%) of participants exhibited good asthma self-care practices. Significant factors associated with good self-care included the absence of comorbidities (AOR 2.0, 95% CI: 1.26-3.10), non-consumption of alcohol (AOR 4.33, 95% CI: 2.52-7.44), non-smoking status (AOR 6.67, 95% CI: 2.46-18.1), and the presence of social support (AOR 1.57, 95% CI: 1.00-2.48).

Conclusion: The study found a relatively high prevalence of good asthma self-care practices among participants. Key factors positively associated with these practices included the absence of comorbidities, non-consumption of alcohol and tobacco, and strong social support. It is recommended that public hospitals and healthcare management implement strategies to promote behavioral changes and enhance self-care education aimed at reducing asthma exacerbation triggers.

Strengths and limitations of this Study

- ✓ This study was carried out across all hospitals located in the East Wollega zone as a multicenter investigation.

- ✓ The research employed face-to-face interview techniques, resulting in a 100% response rate.
- ✓ A limitation of this study is the potential for participant response bias, which may lead to an overestimation or underreporting of self-care practices.
- ✓ The reliance on self-reported data may introduce inaccuracies, as participants might not accurately remember their asthma self-care practices.
- ✓ A qualitative design, which could have strengthened the findings of this cross-sectional study, was not utilized.

Introduction

Asthma is a heterogeneous disease typically characterized by chronic inflammation of the airways. It is defined by early respiratory symptoms, including wheezing, dyspnea, chest tightness, and cough, which can vary in frequency, intensity, and expiratory airflow limitation.[1] Currently, approximately 300 million people worldwide suffer from asthma, with projections indicating an increase of about 100 million cases by 2025. Asthma is responsible for around 250,000 deaths globally, and more than 30 million individuals in the United States have been diagnosed with the condition at some point in their lives.[2] In Africa, countries such as the Democratic Republic of the Congo exhibit notably high asthma prevalence rates, estimated at 6.9%.[3] In Ethiopia, asthma represents one of the most significant public health challenges, contributing to both morbidity and mortality related to respiratory diseases.[4] The prevalence of asthma has risen in recent decades due to various factors, including smoking, occupational hazards, pest infestations in households, economic status, residential environment, and family history of asthma.[5] Asthma self-care practices encompass a range of actions that individuals with asthma can undertake to effectively manage their condition, reduce symptoms, and enhance their quality of life. This includes making lifestyle changes, educating themselves about asthma, and adhering to prescribed medications.[6]

Self-care has become a crucial aspect of managing chronic illnesses, as it is closely linked to a range of positive outcomes for these patients.[7] According to the Middle Range Theory of Self-Care practice of Chronic Illness defines self-care as a set of behaviors aimed at promoting overall health and ensuring adherence to treatment (self-care maintenance), being mindful of one's body and recognizing symptoms (self-care monitoring), and responding appropriately to signs and symptoms as they arise (self-care management.[8-9]

Asthma self-care practices are strategies designed to manage asthma symptoms and minimize the risk of future exacerbations.[10] Self-care practices play a crucial role in managing asthma as they enhance knowledge, decrease hospitalizations, improve quality of life, prevent exacerbations, and are cost-effective.[11] A study conducted in Iraq, the USA, and Saudi Arabia found that asthmatic patients visiting hospitals demonstrate inadequate self-care practices regarding disease characteristics, management of triggering factors, information received from healthcare professionals, and behavioral factors.[12-14]

A study conducted in the northern region of Ethiopia found that a significant percentage (57.3%) of asthmatic patients visiting government public hospitals exhibit poor self-care practices. This inadequacy not only contributes to the rising economic costs associated with poorly managed asthma but also significantly impacts daily activities, resulting in physical, emotional, and social limitations that ultimately diminish quality of life.[15]

The poor implementation of clinical practices can be attributed to various factors, including those related to patients, healthcare professionals, and organizational aspects. Notably, older age, co-morbid conditions, anxiety, lack of social support, and alcohol consumption have been identified as significant contributors to this issue.[15] The government of Ethiopia has decentralized the management of Non-Communicable Diseases (NCDs), including asthma, by providing training to nurses at both hospitals and health centers. This training focuses on how to identify and manage patients before they enter a clinical setting.[16] The implementation of this policy is crucial for preventing asthma complications, effectively managing the condition, and fostering a positive attitude towards self-care practices in asthma management.[15] Although there are recommendations for self-care practices, their implementation has not been extensively studied. Consequently, this research aimed to evaluate self-care practices and the factors associated with them among asthmatic patients receiving follow-up care in public hospitals in East Wallaga, West Ethiopia.

Methods

Study setting, and period

This study was conducted among adult asthmatic patients attending public hospitals in East Wollega, Ethiopia, from May 29 to July 29, 2023. The East Wollega zone includes five hospitals: Wollega University Referral Hospital, Nekemte Comprehensive Specialized Hospital, Gida Ayana General Hospital, Arjo Primary Hospital, and Sire Primary Hospital. Wollega University Referral Hospital and Nekemte Comprehensive Specialized Hospital are

located in Nekemte city, the capital of East Wollega zone. Gida Ayana General Hospital is situated in the northern part of Nekemte town, Arjo Primary Hospital is found in the west, and Sire Primary Hospital is located in the south. Approximately 903 adult asthmatic patients are receiving follow-up care across these hospitals, with 234 patients at Wollega University Referral Hospital, 241 at Nekemte Comprehensive Specialized Hospital, 258 at Gida Ayana General Hospital, 95 at Arjo Primary Hospital, and 75 at Sire Primary Hospital respectively

Study design: An institutional based cross-sectional study design was employed

Source and study population

The source population consisted of all adult asthmatic patients receiving follow-up care at public hospitals in East Wollega zone. The study population included those patients who received follow-up care at the selected hospitals during the data collection period.

Inclusion and Exclusion Criteria

Adult asthmatic patients who visited public hospitals in East Wollega zone and had been receiving follow-up care for at least six months prior to the data collection period were included in the study. Patients with mental health issues that hindered verbal communication were excluded.

Sample size and sampling procedure

The sample size was determined using the single population proportion formula through the Epi Info Stat Calc program, based on a 95% confidence level, a 5% margin of error, and a 42.3% proportion (p) of good asthma self-care practices from a previous study conducted in the Amhara region of Northern Ethiopia,[15] the formula used was: $n=z^2\frac{P\,(1-P)}{d2}$.

Based on these assumptions, the estimated sample size was calculated to be 375. To account for a 10% non-response rate, the final sample size was adjusted to 413. This sample was proportionally allocated to each hospital based on patient flow data from the outpatient department over the previous three months. A systematic random sampling technique was employed to select study participants

The total number of adult asthmatic patients who attended the follow-up clinic in the previous three months across all five hospitals served as the sampling frame. With a total of 903 patients identified, a list of potential participants was created and coded. The sampling interval was calculated to be approximately two (2) for each hospital. The first participant was selected randomly using a lottery method, and subsequently, every second patient on the list was interviewed. Data collection occurred when study participants came to the outpatient department for follow-up care as per their appointments with healthcare providers (Fig 1)

Dependent variable

Self- care practice of asthmatic patients

Independent variables

Socio-demographic characteristic: age, sex, marital status, occupation, residence, education, income

Behavioral, attitude and knowledge related factors: history of cigarette smoking, history of alcohol consumption, physical exercise, social support, depression and anxiety, Knowledge about asthma self-care practice, attitude towards asthma

Clinical related factors: history of comorbidity, exacerbation factors**,** history of hospital admission**,** duration of treatment**,** age diagnosed for asthma**,** presence of exacerbation in past 12 months**,** family history of asthma

Operational definitions

Self-care practices refer to actions or tasks that people take on their own behalf to promote self-care, lessen asthma attacks and cope with illness.[17]

Good self-care practice is when participants who scored above or equal to the mean of self-care practice questionnaire are considered as good asthma self-care practice, and poor self-care practice is when participants who scored below the mean self-care practice questionnaire are considered as poor asthma self-care practice.[18]

Comorbidity is any chronic disease the patient has together with asthma for he/she is taking medications.[19]

Good knowledge is when participants who scored greater than or equal to the mean of knowledge-related questions are categorized as having good knowledge, and poor knowledge is when participants who scored below the mean of knowledge-related questions are considered as having poor knowledge.[20]

Social support is when participants who scored above or equal to the mean from multidimensional social support questions were referred to as having social support and those who scored below the mean considered as having no social support.[21]

Anxiety and depression are when participants who scored between 0–7, 8-10 and 11–21 are taken as having normal, borderline, and abnormal among anxiety and depression question respectively.[22]

Positive attitude is when participants who scored above or equal to the mean from attitude related question and negative attitude is when participants who scored above or equal to the mean from attitude related questions.[23]

Alcohol drinking is defined as the use of any type of alcohol-based beverage, whether locally produced or manufactured in industries, by the participant/s in any volume regularly ranging from days to months. Occasional intakes for holidays, ceremonies, and intakes with a longer than monthly interval was ignored.

Cigarette smoking is described as the habitual use of tobacco, whether locally produced or made in factories, by the participant/s on a daily, weekly, or monthly basis in any form or volume.

Exercise is type of physical activity consisting of planned, structured, and repetitive movements done to improve or maintain physical fitness. E.g. walking, gymnastics, walking, jumping and etc.

Data Collection tool and procedure

Data collection for this study was conducted through face-to-face interviews using a structured questionnaire. The questionnaire was adopted from relevant literature and standardized tools designed to assess asthma self-care practices and associated factors among adult asthmatic patients receiving follow-up care.[18,20-22,24] The original questions were prepared in English and subsequently translated into Afaan Oromo by experts fluent in both languages. To ensure consistency and accuracy, the translated questionnaire was then translated back to English, allowing researchers to verify that the meaning of the questions remained intact. The structured questionnaire consisted of four main parts:

Part one: Demographic Variables: This section collected information on participants' age, sex, marital status, residence, ethnicity, educational status, and occupational status. These variables were essential for understanding the demographic profile of the study participants

Part two: Clinical Related Factors: This section assessed various clinical factors including: Age at which patients were diagnosed with asthma, Presence of other comorbidities, Identified triggering factors for asthma attacks, History of hospital admissions due to asthma, Duration of asthma treatment, Presence of exacerbating factors in the past 12 months, Family history of asthma, Duration of illness

Part three: Knowledge, attitude and behavioral factors: This part focused on assessing participants' knowledge, attitudes, and behaviors related to asthma management

Social support: Social support was measured using the Multidimensional Scale of Perceived Social Support (MSPSS), which consists of twelve items designed to evaluate perceived social support from family, friends, and significant others.[21] Participants rated each item on a five-point scale, where 1 = very strongly disagree, 2 = strongly disagree, 3 = neutral, 4 = strongly agree, and 5 = very strongly agree. The total score for the Multidimensional Scale of Perceived Social Support (MSPSS) ranged from 12 to 60, calculated by summing the scores of all items. Participants who scored equal to or above the mean were classified as having social support, while those scoring below the mean were considered to have no social support.[18]

Anxiety and depression levels were assessed using the Hospital Anxiety and Depression Scale (HADS), which consists of fourteen items. Scores were interpreted as follows: 0–7 indicated normal levels, 8–10 indicated borderline levels, and 11–21 indicated higher levels of anxiety and depression respectively.[18,22]

Knowledge regarding asthma self-care was measured using the Knowledge of Asthma Self-Care Questionnaire (KASQ), which consisted of items scored from 0 to 16. Each question had multiple-choice options labeled A to E, with correct answers receiving a score of 1 and incorrect answers a score of 0. Participants scoring equal to or above the mean on knowledge-related questions were categorized as having good knowledge, while those scoring below the mean were classified as having poor knowledge.[20]

Participant Attitude Questionnaire included five items rated on a scale from 1 to 5 (1 = strongly disagree; 5 = strongly agree). Participants scoring above the mean on these attitude-related questions were classified as having a positive attitude, whereas those scoring below the mean were considered to have a negative attitude.[23]

Part four: Asthmatic self-care practice: The Asthma Self-Care Practice Questionnaire comprised eight items. Participants rated their self-care practices on a four-point Likert scale: 1 = never perform, 2 = sometimes perform, 3 = frequently perform, and 4 = always perform. The total score ranged from eight to thirty-two, calculated by summing the scores for each item. Participants scoring equal to or above the mean were deemed to have good asthma self-care practices, while those scoring below the mean were categorized as having poor asthma self-care practices.[15,18] The tool was validated tool and the pretest was conducted to assess its clarity before the main data collection began.

Data collection procedures

Data collection was carried out by five BSc nurses under the supervision of two BSc nurses who had been trained in asthma self-care practices and associated factors among adult patients receiving follow-up care. Patients attending the asthma clinic who met the inclusion criteria were approached to participate in the study. The data collectors were overseen by the principal investigator and two supervising nurses

Data quality control

A pretest involving 5% of the sample size (21 participants) was conducted at Shambu General Hospital in Horro Guduru Wollega. This pretest evaluated the questionnaire for clarity, simplicity, understandability, consistency, coherence, and applicability.

A reliability test using Cronbach's alpha was performed to assess internal consistency: 82% for asthma self-care practices, 91% for social support, 73% for anxiety and depression, 72% for knowledge of asthma self-care management, and 92% for attitudes toward asthma self-care practices. A one-day training session was provided for both data collectors and supervisors prior to actual data collection, covering questionnaire content, confidentiality maintenance, participant engagement techniques, and privacy considerations. Daily reviews of completed questionnaires were conducted by the principal investigator and supervisors to ensure completeness, accuracy, and clarity.

Data processing and Analysis

The data were coded, verified for completeness, cleaned, and entered into EpiData version 4.6 before being exported to SPSS version 27 for analysis. Descriptive statistics were employed to characterize the variables. The outcomes of the descriptive analysis were presented as frequencies, tables, percentages, means with standard deviations, medians with interquartile ranges, and ranges. The outcome variable was categorized into two groups: good and poor, based on the analyzed mean scores. A binary logistic regression analysis was conducted to examine the associations between the outcome variable and each explanatory variable. Independent variables with a p-value less than 0.25 were selected as candidates for multivariable logistic regression analysis. Following this, multivariable logistic regression was performed, and the statistical significance of the associations between variables was assessed using odds ratios with a 95% confidence interval (CI), where a p-value of less than 0.05 was deemed statistically significant. The backward likelihood ratio (LR) method was employed to identify independent predictors of asthmatic self-care. The model's goodness of fit was evaluated using the Hosmer-Lemeshow test, which yielded a value of 0.887. Additionally, multicollinearity was assessed using tolerance and the Variance Inflation Factor (VIF). There

was no evidence of severe multicollinearity among the independent variables, as the VIF values ranged from 1.074 to 1.237, and tolerance values ranged from 0.802 to 0.932.

Consent to participate

A formal letter of cooperation was prepared and submitted to the public hospitals in the East Wollega Zone. Permission to conduct the study was subsequently granted by the medical director of each hospital. Participants were provided with a comprehensive overview of the study's objectives and instructed on how to complete the questionnaire. They were assured that all information would be treated with the utmost confidentiality. Written informed consent was obtained from each participant prior to their involvement in the study.

Patient and Public Involvement

Patients and the public were not involved in the design, conduct, reporting, interpretation, or dissemination plans of our research. They were not invited to contribute to the writing or editing of this document for clarity or accuracy. However, patients and the community played a role in selecting the research topic as a priority issue. They will also be engaged in disseminating the results and during interventions addressing the identified gaps.

Dissemination: The findings of this study will be shared with Wollega University, the East Wollega Zonal Health Office, the five selected hospitals, and other relevant organizations. Additionally, the results will be published in a peer-reviewed journal.

Results

Socio-demographic characteristics of the study participants

A total of 413 participants took part in the study, achieving a 100% response rate. The median age of the participants was 44 years, with an interquartile range (IQR) of 35 to 57 years. Among the participants, 182 (44.1%) were aged between 35 and 54 years. The gender distribution indicated that 220 (53.3%) of the participants were male. The majority, 239 (57.9%), were married. More than half of the respondents, 219 (53%), identified as Protestant. In terms of ethnicity, the vast majority, 370 (89.6%), belonged to the Oromo ethnic group. Additionally, 241 (58.4%) lived in urban areas. Regarding educational attainment, approximately 124 (30%) were unable to read and write, while 121 (29.3%) identified as farmers. The median monthly household income was 900 ETB, with an IQR of 400 to 2650 ETB (Table 1).

Table 1: Socio demographic characteristics of adult asthmatic patients at public hospitals in East Wallaga zone receiving follow-up care OPD, Western Ethiopia, 2023 (n=413)

Variables	Categories	Frequency	Percent
Sex	Male	220	53.3
	Female	193	46.7
Age groups(years)	18-34	100	24.2
	35-54	182	44.1
	≥55	131	37.1
Marital status	Single	100	24.2
	Married	239	57.9
	Divorced	40	9.7
	Widowed	34	8.2
Religion	Orthodox	135	32.7
	Muslim	59	14.3
	Protestant	219	53
Ethnicity	Oromo	370	89.6
	Amhara	29	7
	Others*	14	3.4
Residence	Urban	241	58.4
	Rural	172	41.6
Educational status	Unable to read & write	124	30
	Primary school	89	21.5
	Secondary school	111	26.9
	College and above	89	21.5
Occupational status	Student	58	17
	Daily labor	65	15.7
	Farmer	121	29.3
	House wife	58	14
	Merchant	56	13.6
	Civil servant	55	13.3
Average monthly income (ETB)	≤1000	242	58.6
	1001-2000	56	13.6
	2001-3000	23	5.6
	3001-4000	20	4.8
	≥4001	72	17.4

Clinical characteristic of the study participants

Regarding the clinical characteristics of the study participants, nearly half, 198 (47.9%), were diagnosed with asthma between the ages of 25 and 49 years. Approximately 136 (32.9%) participants reported having asthma for a duration of 2 to 5 years. Additionally, about 170 (41.2%) participants had a family history of asthma. Among the participants, 161 (39%) had

co-morbid conditions, with 53 (12.8%) specifically diagnosed with hypertension. Approximately three-quarters of the participants, 286 (69.2%), experienced frequent asthma exacerbations in the past year. Less than half, 151 (36.6%), had been hospitalized in the last 12 months, with 42 (27.8%) of those admissions attributed to asthma. Furthermore, the majority of participants, 350 (84.7%), experiencing asthma triggers factors. (Table 2).

Knowledge, attitude, and behavior characteristics of the study participants

Out of the participants, 112 (27.1%) reported having consumed alcohol at some point in their lives, with 57 (50.9%) of these individuals currently drinking alcohol. Additionally, 54 (12.1%) of participants were former cigarette smokers, and among them, 31 (57.4%) were currently smoking more than eleven cigarettes per day. Furthermore, a substantial majority, 348 (84.5%), engaged in regular physical exercise.

Regarding social support, half of the study participants, totaling 207 (50.1%), reported having no social support. Additionally, a significant portion of the participants experienced mental health challenges, with approximately 78.7% reporting anxiety and 54.7% indicating symptoms of depression. The study also found that 155 participants (37.5%) had poor knowledge about asthma self-care practices. Moreover, less than half of the participants, specifically 147 (35.6%), held negative attitudes toward asthma self-care practices. (Table 3).

Table 2: Clinical characteristics of adult asthmatic patients at public hospitals in East Wallaga zone receiving follow up OPD, West Ethiopia,2023 (n=413)

Variables	Categories	Frequency	Percent
Age at asthma diagnosis (year)	<25	166	40.2
	25-49	198	47.9
	≥50	49	11.9
Duration living with asthma (year)	<2	73	17.7
	2-5	136	32.9
	6-10	105	25.4
	11-20	70	16.9
	>20	29	7.0
Family history of asthma	Yes	170	41.2
	No	243	58.8
History of co-morbidity	Yes	161	39.0
	No	252	61.0
Types of co-morbidity	Heart failure	25	15.5
	Diabetes mellitus	29	18
	Renal disease	33	20.5
	Hypertension	53	33
	Others**	21	13
History of asthma exacerbation in the last 12 months	Yes	286	69.2
	No	127	30.8
History of admission to hospital in last 12 months	Yes	151	36.6
	No	262	63.4
If yes, cause of admission	Asthma	42	27.8
	Others***	109	72.2
Triggering factors which exacerbate asthma attack	Yes	350	84.7
	No	63	15.3

Table 3: Knowledge, attitude and behavioral characteristics of adult asthmatic patients at public hospitals in East Wallaga zone receiving follow up care OPD, West Ethiopia,2023(n=413)

Variables	Categories	Frequency	Percent
Do you ever drink alcohol	Yes	112	27.1
	No	301	72.9
Are you currently drinking alcohol	Yes	57	50.9
	No	55	49.1
If yes, how many times a week	<2	20	35
	≥2	37	65
Do you ever smoke	Yes	54	13.1
	No	359	86.9
Do you currently smoke cigarettes	Yes	31	57.4
	No	23	42.6
If yes, how many cigarettes do you smoke per day	<5	7	22.6
	5-10	6	19.4
	≥11	18	58
Have you been doing regular physical exercise	Yes	349	84.5
	No	64	15.5
If yes, which physical exercise do you practice	Walking	316	90.6
	Gymnastic	13	3.7
	Running	20	5.7
Duration of doing regular physical exercise per day (in minute)	<30 minutes	193	46.7
	≥ 30 minutes	156	37.8
Social support	Have social support	206	49.9
	No social support	207	50.1
Anxiety	Normal	12	2.9
	Borderline	76	18.4

	Abnormal	325	78.7
Depression	Normal	97	23.5
	Borderline	90	21.8
	Abnormal	226	54.7
Knowledge	Poor knowledge	155	37.5
	Good knowledge	258	62.5
Attitude	Negative attitude	147	35.6
	Positive attitude	266	64.4

Proportion of asthma self-care practice

Among the 413 study participants, 213(51.6%) had asthma good self-care practice with 95% CI (46.7, 56.4) (Fig.2)

Factors associated with self-care practice

Bivariable logistic regression was employed to examine the relationship between each independent variable and the outcome variable (asthma self-care practice). Variables demonstrating an association with a p-value of less than 0.25 were subsequently included in the multivariable logistic regression model. In the binary logistic regression analysis, the following variables were identified as candidates for the multivariable model: residence, co-morbidity, family history of asthma, history of asthma exacerbation, triggering factors, ever drink alcohol, ever smoke cigarette, social support, depression, and attitude, all with p-values below 0.25. The multivariable logistic regression analysis revealed that co-morbidity, past cigarette smoking, past alcohol consumption, and social support were significant predictors of self-care practices among asthmatic patients. Notably, the absence of co-morbidity was significantly associated with better self-care practices; participants without co-morbidities had higher odds of exhibiting good self-care practices compared to those with co-morbidities (AOR: 2.0, 95% CI: 1.26-3.10). Additionally, there was a significant correlation between never consuming alcohol and self-care practices. Participants who reported never drinking alcohol had greater odds of practicing good self-care compared to those who had consumed alcohol at any point (AOR: 4.33, 95% CI: 2.52-7.44). Similarly, individuals who had never smoked demonstrated a significant association with good self-care practices compared to those who had smoked; the odds of practicing good self-care were lower among those who reported ever smoking (AOR: 6.67, 95% CI: 2.46-18.1). Lastly, participants who

reported having social support also exhibited a significant association with good self-care practices. Those with social support had higher odds of engaging in good self-care compared to individuals lacking such support (AOR: 1.57, 95% CI: 1.00-2.48) (Table 4)

Discussion

This study was aimed to assess the magnitude of good self-care practice and associated factors among adult asthmatic patients on the follow-up care at public hospitals in East Wollega zone, West Ethiopia. The results indicated that over half (51.6%) of the participants demonstrated good asthma self-care practices in the study area. These findings are consistent with a study conducted in Bangladesh [18] and Taiwan [25] in which good asthma self-care practice was found to be 49.63% and 51.5% respectively. In contrast, this finding is lower than the 57.1% reported in a study conducted in Saudi Arabia.[14] The discrepancy in results may be attributed to variations in the health-related information provided, the study design (which utilized a mixed-method approach), and the availability of resources, health facilities and health education programs have enhanced patients' understanding of self-care. However, the study was limited by a small sample size of 125 participants, as well as the impact of lifestyle modifications and the socio-demographic characteristics of those involved on asthma self-care practices. Additionally, this finding was higher than those reported in studies conducted in the northern region of Ethiopia 42.3%, and Rwanda 33.8% respectively.[15,17]

In the northern region of Ethiopia, this discrepancy may be attributed to several factors, including the socio-demographic characteristics of the study participants, with 30.2% lacking formal education. Additionally, the study did not evaluate patients' attitudes toward asthma self-care practices, and it was conducted in a limited number of settings (only three hospitals). Furthermore, a significant portion of participants demonstrated poor knowledge of asthma self-care practices (41.5%), and there were prevalent socio-cultural habits among the participants, such as a 75.5% rate of alcohol consumption. In Rwanda, this discrepancy may be attributed to several behavioral factors, including a 45.5% rate of alcohol consumption among participants. Other contributing elements include the duration of the study, a limited sample size, and the fact that the research was conducted across only three health centers and one hospital. Furthermore, participants in the current study demonstrated a higher level of knowledge and a more positive attitude toward asthma self-care practices compared to findings from studies conducted in the northern region of Ethiopia and Rwanda respectively.[15,17]

Table 4: Bivariable and multivariable logistic regression analysis for factors associated with good self-care practice among patients with asthmatic receiving follow up-care OPD at public hospitals in East Wallaga zone, West Ethiopia, 2023(n=413)

Variables	Categories	Self-care practice		COR 95% CI	p-value	AOR 95% CI	p-value
		Good	Poor				
Residence	Urban	131	110	1.30(0.88-1.93)	0.18	1.02(0.64-1.62)	0.93
	Rural	82	90	1		1	
Family history of asthma	Yes	91	79	1			
	No	109	134	1.42(0.96-2.10)	0.08	1.24(0.79-1.95)	0.35
Co-morbidity	Yes	99	62	1		1	
	No	101	151	2.39(1.59-3.58)	0.01	**2(1.26-3.10) ***	0.03
History of asthma	Yes	147	139	1			
	No	53	74	1.48(0.97-2.25)	0.07	1.10(0.67-1.83)	0.70
Triggering factors	Yes	98	88	1			
	No	102	125	1.37(0.93-2.01)	0.12	1.26(0.79-2.00)	0.32
Ever drink alcohol	Yes	88	24	1		1	
	No	112	189	6.19(3.72-10.29)	0.01	**4.33(2.52-7.44) ***	0.01
Ever smoke	Yes	49	5	1		1	
	No	150	208	13.59(5.25-34.69)	0.01	**6.67(2.46-18.1) ***	0.01
Social support	Have social support	124	82	2.56(1.72-3.80)	0.01	**1.57(1.00-2.48) ***	0.04
	No social Support	77	130	1		1	
Depression	Normal	51	46	1.06(0.47-1.22)	0.25	1.06().57-1.77)	0.99
	Borderline	46	44	1.25(0.49-1.31)	0.37	0.79(0.45-1.40)	0.43
	Abnormal	103	123	1			
Attitude	Positive	122	144	0.75(1.24-1.99)	0.16	1.04(0.64-1.69)	0.87
	Negative	78	69	1		1	

Asthmatic patients with social support were found to be 1.57 times more likely to engage in good asthma self-care practices compared to those without social support. This suggests that having social support may enhance self-care behaviors, ultimately leading to improved self-care practices. These findings align with a study conducted in the northern region of Ethiopia, which indicated that asthmatic patients lacking social support were nearly twice as likely to exhibit poor self-care practices compared to their counterparts who had social support.[15] Another study conducted in the U.S. supports this finding, demonstrating that social support from family and friends is crucial for individuals with chronic illnesses, such as asthma. This support helps them develop a positive self-concept and self-esteem, which in turn fosters emotional and social backing for effective self-care practices. Specifically, it aids in medication adherence and ensures that patients have accompaniment to healthcare facilities on the day of their appointments.[24-25]

Asthmatic patients without comorbid illnesses were twice as likely to engage in effective asthma self-care practices compared to those with comorbid conditions. This indicates that the presence of comorbidities is associated with a higher likelihood of inadequate self-care among participants. These findings align with a study conducted in the northern region of Ethiopia, which found that asthmatic individuals with comorbid illnesses were nearly twice as likely to exhibit poor self-care practices compared to those without any comorbid conditions.[15] Comorbid illnesses can exacerbate a patient's condition, hindering their ability to adhere to self-care practices. This complexity complicates the diagnosis and management process, potentially resulting in misdiagnosis, under-treatment, or over-treatment.[26]

Asthmatic patients who did not smoke cigarettes were 6.67 times more likely to demonstrate effective asthma self-care practices compared to those who did smoke. This indicates that a history of smoking is linked to a higher likelihood of poor self-care behaviors, which can damage the lungs and alveoli. Notably, individuals who smoke more than 11 cigarettes per day seem to be particularly at risk for exacerbating their asthma symptoms.[27]

The Global Initiative for Asthma Strategy 2021 emphasizes that abstaining from smoking is an important self-care practice for individuals with asthma. Smoking can significantly exacerbate asthma symptoms and lead to more severe health complications. By choosing to refrain from smoking, patients are actively managing their health and taking proactive steps to enhance their respiratory function and overall well-being.[28]

Another study found in Taiwan supports this finding; patients with no smoking history who quit smoking have better self-care practices than those who continue to smoking.[25] Cigarette smoking is linked to a faster decline in lung function, greater reliance on health services, and heightened severity of asthma symptoms. This highlights how quitting smoking can enhance lung function in adult asthmatic patients. However, it is important to note that asthmatic individuals who smoke may exhibit poor self-care practices.[29]

Asthmatic patients who abstained from alcohol were 4.33 times more likely to demonstrate good self-care practices compared to those who consumed alcohol. This suggests that individuals with a history of alcohol consumption tend to engage in poorer self-care. This finding aligns with a study conducted in northern Ethiopia, which found that asthmatic patients who drank alcohol were nearly twice as likely to adopt poor self-care practices compared to their non-drinking counterparts.[15] Additionally, alcohol consumption can harm the lungs and trigger asthma exacerbations. Consequently, asthmatic patients who drink may neglect their medications and demonstrate decreased self-care practices.[17] Consuming alcohol, particularly wine, seems to be a significant trigger for asthma exacerbations, leading to alcohol-induced asthma. This condition results in pathological bronchoconstriction, impacting many individuals with asthma.[30]

Strengths and limitations

The current study has several strengths. It utilized a structured questionnaire to collect comprehensive information on self-care practices and related factors among asthmatic patients, resulting in a strong dataset for analysis. The use of face-to-face interviews contributed to a 100% response rate. Additionally, the research was conducted across all hospitals in the East Wollega zone, enhancing its multi-center approach. However, there are notable limitations. Firstly, the cross-sectional design of the study prevents the establishment of causal relationships between asthma self-care practices and associated factors. Secondly, self-reported data on asthma self-care practices may lead to biases, potentially inflating or deflating reported practices. Thirdly, participants might struggle to accurately recall their self-care practices, introducing inaccuracies and bias in reporting. Lastly, the findings may not be applicable to all asthmatic patients in Ethiopia or other regions, as the sample was drawn from a specific zone with distinct socio-cultural characteristics.

Conclusion

The study found that just over half of the asthmatic patients in the area demonstrated good self-care practices. This indicates that a considerable number of asthmatic patients may not be fully

adhering to the recommended self-care behaviors. Furthermore, the research identified several significant factors associated with good self-care practices among these patients, including the absence of comorbid conditions, a history of never consuming alcohol, being a non-smoker, and having robust social support.

Implications of the finding

Our findings highlight that asthma poses a significant health challenge in the East Wollega zone. These findings underscore the importance of asthma as a public health issue in the zone and highlight the need for public hospitals and hospital management to prioritize interventions promoting behavioral changes, to empower patients to practice better self-care and strengthening self-care practices, particularly by addressing modifiable triggers are needed

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Ethical approval: The study received approval letter from the Research and Ethical Review Committee of the Institute of Health Sciences at Wollega University with reference number of WU/RD/655 on the date of 29/05/2023 G.C. All protocols were conducted in accordance with the ethical guidelines established by Wollega University. Written informed consent was obtained from each participant in the study. To ensure confidentiality, no personal identifiers,

such as names, ID numbers, or phone numbers, were recorded. The information collected from each participant was securely stored in a locked facility.

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Availability of data and materials: The datasets utilized or analyzed during the current study are available from the corresponding author upon reasonable request. All the supplemental information was included.

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Figure legends

Figure 1: Schematic presentation of proportional allocation of the sample size for each public hospital in East Wollega Zone, West Ethiopia, 2023

Figure 2. Self-care practices of adult asthmatic patients at public hospitals in East Wallaga zone receiving follow up care OPD, West Ethiopia,2023

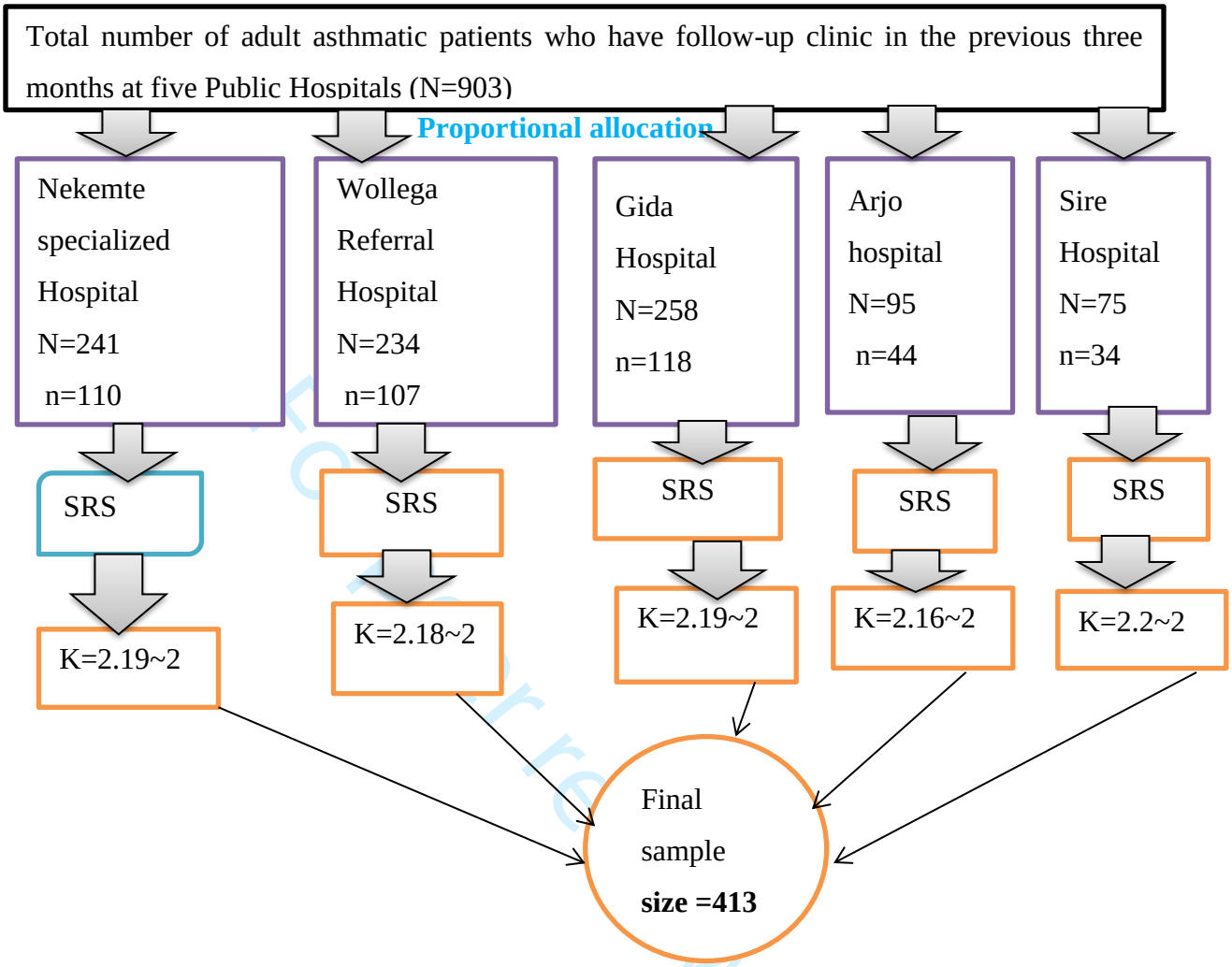

Figure 1: Schematic presentation of proportional allocation of the sample size for each public hospital in East Wollega Zone, West Ethiopia, 2023

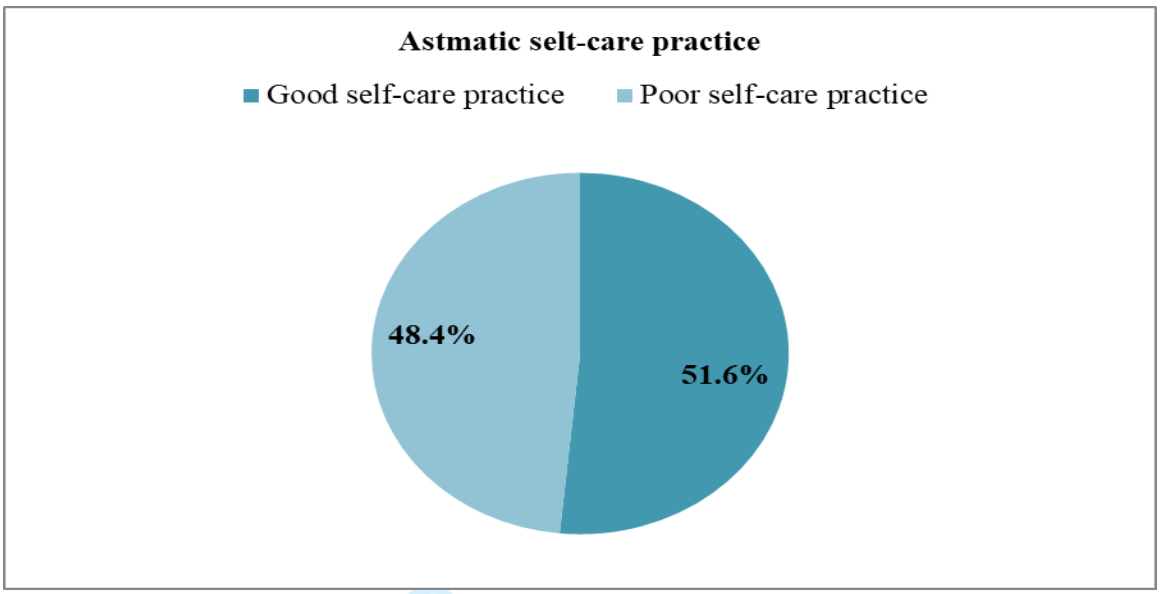

Figure 2. Self-care practices of adult asthmatic patients at public hospitals in East Wallaga zone receiving follow up care OPD, West Ethiopia,2023

ANNEX I

ENGLISH VERSION QUESTIONNAIRE

General instruction

1. For multiple choice questions circle to the number which contains your correct answer (the most appropriate answer) in the space provided.
2. If your answer is not listed among alternatives, please tell your own answer for the data collector

Part I: Socio demographic and health status data

Date: _____Code_____

Q/N	Questions	Response
101	How old are you?	_____years
102	Sex?	1. Male 2. Female
103	What is your marital status?	1. Single 2. Married 3.Divorced 4. Widowed
104	Residence?	1. Urban 2. Rural
105	Ethnicity?	1. Oromo 2. Amhara 3. Tigray 4. Other(specify)____
106	What is your religion?	1.Orthodox 2. Muslim 3.Protestant 4. Others(specify) ----------
107	What is your educational status?	1. Unable to read and write 2. Primary school 3. Secondary school 4. College and above
108	What is your occupation?	1. Student 2. Daily laborers 3. Farmer 4. House wife 5. Merchant 6. Civil servant 7. Other (specify)_____
109	Income (average monthly income)	_____Ethiopia birr

Part II. Clinical characteristics related factor

No	Questions	Response
301	Age at which the asthma occurred (in years)	_____years
302	Duration of Asthma since diagnosis	_____years
303	Family Hx of asthma	1. Yes 2. No
304	Do you have any Co-morbidity?	1. Yes 2. No
305	If yes to question No 304, which one?	1. Chronic heart failure 2. Diabetes mellitus 3. Renal disease 4. Chronic liver disease 5. Hypertension 6. Other (specify)----------
306	History of asthma exacerbation in last 12 months	1. Yes 2. No
307	Have you been admitted in the hospital within the past 12 months	1. Yes 2. No
308	If your answer is yes for the above question No 307, what was the cause for admission	1. Asthma 2. Others
309	Triggering factors (you can select more than one option)	1. Seasonal variations 2. Dusts3. Pets 4.Stressful events 5. Pollens 6. Physical exercise 7. Molds 8. Emotions 9. Smoke 10. Others(specify)_____

Part III. Behavioral and Psychological related factor

A. Questionnaires to assess factors of behavioral habit

Q/N	Questions	Response	Skip
501	Are you ever drinker alcohol?	1. Yes 2. No ----------	504
502	Are you currently drinking alcohol?	1. Yes 2. No ----------	504
503	If**Q502 is yes**, how many times a week?	_____	
504	Are you ever smoker?	1. Yes 2.No ----------	507
505	Are you currently smoking?	1. Yes 2. No----------	507
506	If **Q505 yes**, how many cigarettes do you smoke per day	_____	
507	Have you doing regular physical exercise	1. Yes 2. No----------	601
508	If **Q507 yes**, which physical exercise do you practice	1. Waking 2. Gymnastic 3. Running 4. Other(specify)---	
509	For how much minute per day	_____ minute	

B. **Psychological factor: Multidimensional Scale of Perceived Social Support**

Q/N	**Social support questions**	V/Strongly disagree	Strongly disagree	Neutral	Strongly agree	Very Strongly
		1	2	3	4	5
601	There is a special person who is around when I am in need					
602	There is a special person with whom I can share joys and sorrows.					
603	My family really tries to help me.					
604	I get the emotional help & support I need from my family.					
605	I have a special person who is a real source of comfort to me					
606	My friends really try to help me.					
607	I can count on my friends when things go wrong.					
608	I can talk about my problems with my family.					
609	I have friends with whom I can share my joys and sorrows					
610	There is a special person in my life who cares about my feelings.					
611	My family is willing to help me make decisions					
612	I can talk about my problems with my friends.					

C. Anxiety and Depression Scale HADS Questionnaires

Please check you have answered all the questions Scoring: Depression (D) , and Anxiety (A) _____ 0-7 = Normal, 8-10 = Borderline abnormal (borderline case), 11-21 = Abnormal (case) Total score:					
D	**A**		**D**	**A**	
701		I feel tense or 'wound up':		708	I feel as if I am slowed down
	3	Most of the time	0		Nearly all the time
	2	A lot of the time	1		Very often
	1	From time to time, occasionally	2		Sometimes
	0	Not at all	3		Not at all
702		I still enjoy the things I used to enjoy:		709	I get a sort of frightened feeling like 'butterflies' in the stomach:
0		Definitely as much		3	Not at all
1		Not quite so much		2	Occasionally
2		Only a little		1	Quite Often
3		Hardly at all		0	Very Often
703		I get a sort of frightened feeling as if something awful is about to happen:		710	I have lost interest in my appearance:
	3	Very definitely and quite badly	0		Definitely
	2	Yes, but not too badly	1		I don't take as much care as I should
	1	A little, but it doesn't worry me	2		I may not take quite as much care
	0	Not at all	3		I take just as much care as ever
704		I can laugh and see the funny side of things:		711	I feel restless as I have to be on the move:
0		As much as I always could		3	Very much indeed
1		Not quite so much now		2	Quite a lot
2		Definitely not so much now		1	Not very much
3		Not at all		0	Not at all
705		Worrying thoughts go through my mind:		712	I look forward with enjoyment to things:
	3	A great deal of the time	0		As much as I ever did
	2	A lot of the time	1		Rather less than I used to
	1	From time to time, but not too often	2		Definitely less than I used to

	0	Only occasionally	3		Hardly at all
706		I feel cheerful:		713	I get sudden feelings of panic:
0		Not at all		3	Very often indeed
1		Not often		2	Quite often
2		Sometimes		1	Not very often
3		Most of the time		0	Not at all
707		I can sit at ease and feel relaxed:		714	I can enjoy a good book or radio or TV program:
	3	Definitely	0		Often
	2	Usually	1		Sometimes
	1	Not Often	2		Not often
	0	Not at all	3		Very seldom

D. Knowledge of Asthma self-management questionnaire

Assign one point for each preferred response sum all pointes to generate the row score range from 0-16. Transform the row score to range from 0-100 transform score= (raw score/16) *100 report the transformed score higher score indicates more knowledge of asthma self-management			
801	A main method of prevent asthma flare-ups is to--	805	The correct way to use of a peak flow meter is to
	A. Take medicine before meals B. Take steroid in pill form C. Get a flu vaccine D. Go to emergency room at the first sign of symptom E. I don't know		A. Take deep breath and then blow in to mouth piece slowly B. Start exhaling and then put the mouth piece in your mouth C Put the mouth piece in your mouth and then inhale and exhale D. Take deep breath and then blow in to mouth piece as fast as you can E. I don't know
802	Taking prescribed two puff of your inhaler two times per day	806	Rescue medications
	A. Is the same taking one puff four times day B. Is the same taking four puff once day C. can be arrange in away as long as you four times a day D. Is not the same as any other region E. I don't know		A. Should not be taken more than three or four times per day B. Help prevent future flare ups C. Have no side effects D. Don't cause you become tolerant to medicine E. I don't know
803	If you are not having symptom of asthma	807	When use your inhaler you should
	A. Your lung is not sensitive to irritant B. It is ok to skip same dose of medicine		A. Take shallow breaths B. Inhale quickly C. Inhale slowly

	C. You should still avoid triggers D. You are probably of cured asthma E. I don't know		D. Press your inhaler several times while you are inhaling E. I don't know
804	Maintenance medicines	808	After you have used your inhaler you should
	A. help prevent feature symptom B. do not to be taken every day C. make your breath better right after you take them D. can only be taken in pill form E. I don't know		A. hold your breath for several B. Take the second puff as soon as possible after the first puff C. keep taking puff until you feel better D. wash the inhaler in the tube of water E. I don't know
809	If you are having symptom don't know why	813	Asthma can be cured by
	A. Some dose of steroid medication B. Call your doctor C. Count how fast you are breathing D. Change your immediate environment E. I don't know		A. Taking daily medicine B. Avoid trigger such as dust and cigarette smoking C. Using a peak flow meter D. There is no known for cure asthma E. I don't know
810	Taking more rescue medication prescribe	814	Asthma flair up
	A. Is really not harm full B. Is good way managing a symptom C. May mean you can take less maintenance medicine D. May mean you need more maintenance medicine E. I don't know		A. Usually occur suddenly with out B. Can occur when several minor triggers come to gather C. Cannot be triggered by strong emotion D. Always cause wheezing E. I don't know
811	The benefit of using a peak flow meter every day is	815	If you are prescribed a seven-day course of steroid pills

	A. You can detect small change B. It can tell you when you can decrease your medicine C. You can see how well you can inhale D. You can have a way to compare yourself to other people E. I don't know		A. You don't have to avoid triggers while you are taking the pills B. Your symptom can't get worse while you are taking the pill C. You don't need to use your peak flow meter while you are taking the pills D. You should finish the proscription even if you feel better after several dose E. I don't know
812	For people with asthma exercise	816	Which of the following can help control asthma
	A. Is something that should not be done B. Can help improve breathing capacity C. Is only good if done 30 minutes at a time D. Can trigger symptom because the lung are not taking in enough oxygen E. I don't know		A. Reduce stress level B. Drinking plenty of water to stay hydrated C. Avoid foods with sulfates, such as dried fruits and wine D. All of the above E. I don't know

E: Questions to assess the participant's attitude toward asthma

Instruction: Read each statement carefully and put 1 for strongly disagree, 2 for disagree, 3 for neutral, 4 for agree and 5 for strongly agree in the corresponding column that most likely reflects the respondents answer to the following questions

S/N	Questions	Strongly disagreed	Disagree	Neutral	Agree	Strongly agree
901	Following a healthy diet and life style will help control your asthma					
902	It is important for you to take your asthma medications as prescribed					
903	Your family can help you to remain calm during your asthma episode					
904	You can learn to be an effective asthma self-manager.					
905	The more you know about asthma, the more you can help your self					

Part IV: Self-care practice questionnaire

The Asthmatic Self-care Practice Questionnaire a four-point Likert scale ranged from 1 to 4; 4= always perform, 3= frequent perform, 2= sometimes perform, and 1=never perform. The score of Asthmatic Self-Care Practice Questionnaire calculated from summing the total score ranged from 9 to 32.					
Q/N	**Self-care practice**	Always perform	Frequent perform	Sometimes perform	Never perform
201	Do you smoke cigarette				
202	Do you live with a person who smoke cigarette				
203	Avoid contact with furry animals (e.g., cats, dogs)				
204	Reduce pollen exposure				
205	Reduce exposure to house dust mite				
206	Avoid sensitizers and irritants (dust and fumes) which aggravate or cause asthma especially in the workplace				
207	Avoid food and beverages containing preservatives				
208	Avoid drugs that aggravate asthma such as beta-blockers and aspirin and non-steroidal anti-inflammatory drugs				

Thank you for your participation

ANNEX II.

WARRAAQSA ODEEFFANNOO AFAAN OROMOON

Kutaa I: Odeeffannoo hawaasa-dimoogiraafii fi haala fayyaa isaanii

Guyyaa: _____ kooddii_____		
Lak	**Gaaffiileee**	**Deebiii gaaffilee**
101	Umriin kee meeqa?	_____waggaa
102	Saalaa?	1. Dhiira 2. Dhalaa
103	Haalli gaa'ela keessanii akkamii?	1. Hin fuune/hin heerrumne 2. Fudheera/heerumeera 3. Hiikeen jira 4. Naa irra du'e/tte
104	Bakka jireenyaa keessan ?	1. Magaala 2.Baadiyyaa
105	Sabummaan keessan?	1. Oromoo 2. Amaharaa 3.Tigiree 4.kan biroo (ibsi)_____
106	Amantiin kee maalii?	1.Orthodoksii 2.Muslima 3.Protestaantii 4.Kan biroo(ibsi) ----------
107	Haalli barnootaa keessan akkami?	1. Dubbisuu fi barreessuu hin danda'u 2.M/B/sadarkaa 1ffaa 3. M/B/sadarkaa 2ffaa 4. Kolleejjii fi isaa ol
108	Hojiin kee maali?	1. Barataa 2. Hojjetoota guyyaa guyyaa 3. Qotee bulaa 4. Hojii Manaa keessan hojjedha 5. Daldalaa 6.Hojjetaa mootummaa 7. Kan biroo (ibsi)_____
109	Galii giddugaleessa ji'aatti argattan meeqa ta'a	_____ birri Itoophiyaan

Kutaa II: Gaaffii shaakala kunuunsa asmii ofiif taasisaan

4= yeroo hunda raawwachuu, **3**= yeroo baay'ee raawwachuu, **2**= yeroo tokko tokko raawwachuu, fi **1**=gonkumaa raawwachuu dhiisuu.					
	Shaakala of kunuunsuu	**4**	**3**	**2**	**1**
201	Sigaaraa ni xuuxaa?				
202	Nama sigaaraa xuuxu waliin nijiraattaa?				
203	Bineensota rifeensa qaban (fkn ,saree ,aduree) waliin wal tuttuqqaa gochuu irraa of qusattaa?				
204	Saaxilamuu pooleenii (kakkaastuu) ni hir'istaa?				
205	Saaxilamummaa dafqa manaa ni hir'istaa?				
206	Keessattuu bakka hojiitti wantoota miira namaa kakaasan fi nama aarsan, gaasii dhukkuba asmii hammeessan ykn fidan irraa ni fagaattaa?				
207	Nyaataa fi dhugaatii wantoota nyaata ittisan of keessaa qaban irraa ni fagaattaa?				
208	Qorichoota dhukkuba asmii hammeessan kanneen akka beta-blockers (copha ijaa dabalatee), fi aspirin fi non-steroidal irraa of ni fageessitaa?				

Kutaa III. Amaloota mana yaalaa wajjin walqabatee

Lakk	Gaaffiiee	Deebii
301	Umurii meeqatti dhukkubni asmii si qabee	_____waggaadhan
302	Dhukkuba Asmii qabachuu kee erga adda ba'ee hangaam ta'eera?	_____Waggaadhan
303	Maatii seenaa dhukkuba asmii qabu qabdaa?	2. Eyyee 2. Lakkii
304	Dhukkuba qancarroo asmii waliin walittii dhufeenya qaban qabda(Co-morbidity)?	1. Eyyee 2. Lakkii
305	Gaaffii Lakk 304 irratti eeyyee yoo ta'e isa kam?	**1**. Dadhabbii onnee yeroo dheeraa 2. Dhukkuba sukkaaraa 3. Dhukkuba kalee 4. Dhukkuba tiruu 5. Dhiibbaa dhiigaa 6. Kan biroo (ibsi)_____
306	Ji'oota 12 darban keessatti dhukkubni asmii sitti hammacha tureeraa?	2. Eyyeen 3. Lakkii
307	Ji'oota 12 darban keessatti hospitaala ciiftee beektaa?	2. Eyyeen 2. Lakkii
308	Gaaffii lakk 307, kanaaf deebiin kee eeyyee yoo ta'e sababni ati ciifteef maali ture?	2. Asmii 2. Kanneen biroo
309	Wantoota asmii natti kakaasan jettee yaadduu filadhu. Deebbii tokkoo of filachuu ni dandeessa	2. Jijjiirama waqtiilee 2. Dafqa manaa 3. Bineensota manaa 4. Taateewwan dhiphina 5.Pollenii garagaraa 6. Sochii qaama taasisuu 7. Suphee/lafa 8. Miira aarii 9. Sigaaraa aarsuu 10. Kan bieoo(ibsi)_____

Kutaa IV. Qabxii amala waliin walqabatu

Gaaffiiwwan sababoota amala madaaluuf nu gargaaran

Lak	Gaaffiilee	Deebii	Darbii
501	Alkoolii dhugdee beektaa?	1. Eyyee 2. Lakkii ----------	504
502	Yeroo ammaa kana dhugaatii alkoolii ni dhugduu?	1. Eyyee 2. Lakkii----------	504
503	Yoo **gaaffiin 502 eeyyee** ta'e torbanitti yeroo meeqa dhugduu?	_____	
504	Tamboo xuuxxee beektaa?	1. Eyyee 2.Lakkii ----------	507
505	Yeroo ammaa kana tamboo xuuxaa jirtaa?	1. Eyyee 2. Lakkii----------	507
506	Yoo **gaaffiin 505 eeyyee** ta'e guyyaatti sigaaraa meeqa xuuxa?	_____	
507	Sochii qaamaa yeroo hunda ni taasistaa?	1. Eyyee 2. Lakkii----------	601
508	Yoo gaaffiin **507 eeyyee** ta e sochii qaamaa akkamii taasisaa jirtaa?	1. Miilaan deemuu 2. Jiimnaastikii 3. Fiigicha 4. Kan biroo (ibsi)__	
509	Guyyaatti daqiiqaa meeqaf sochii qaamaa taasiftaa?	_____ daqiiqaa	

Kutaa V: Qabxii xiinsammuu

I. Gaaffilee Qajeelfama deeggarsa hawaasummaa nama hubamef taasifaamu qabu 1= Baayee cimsee irratti walii hin galu, **2**= Cimsee irratti walii hin galu, **3**= Giddu galeessa , **4**= ciimsee irratti waliin gala, fi **5**= Baay'ee cimsee irratti waliin galla

Lak	Gaaffilee	1	2	3	4	5
601	Namni addaa yeroo rakkattuu naannoo kee jira?					
602	Namni addaa gammachuu fi gadda waliin qooddachuu dandeessu jiraa					
603	Maatiin kee dhuguma si gargaaruuf yaalu.					
604	Gargaarsa miiraa fi deeggarsa si barbaachisu maatii kee irraa ni argattaa					
605	Nama addaa madda jajjabina dhugaa sif ta'e qabda.					
606	Hiriyoonni kee dhuguma ni gargaaruuf yaalu.					
607	Yeroo wanti tokko dogoggora ta'u hiriyyoota keetti himachuu ni dandeessa.					
608	Waa'ee rakkoo kee maatii kee wajjin haasa'uu ni dandeessa					
609	Hiriyyoota gammachuu fi gadda kee waliin qooddattu qabda					
610	Jireenya kee keessatti namni addaa miira keetiif dhimmamutu jira.					
611	Maatiin kee murtoo akka godhattu si gargaaruuf fedhii qabu					
612	Rakkoo kee hiriyoota kee wajjin haasa'uu ni dandeessa.					

II. Gaaffilee Iskeelii Yaaddoo fi Dhiphina safaraan

Qabxii: Dhiphina sammuu (D) _____ Yaaddoo (A) _____ .					
D	A		D	A	
701		Dhiphinni ykn 'madaa'ee' sitti ni dhaga'ama:		708	Akka waan saffisa koo hir'iseetti natti dhaga'ama
	3	Yeroo hunda	0		Yeroo hunda jechuun ni danda'ama
	2	Yeroo baayyee	1		Yeroo baayyee
	1	Darbee darbee	2		Yeroo tokko tokko
	0	Gonkumaa miti	3		Gonkumaa miti
702		Ammas wantoota duraan itti gammadutti nan gammada:		709	Garaa keessatti miira sodaa akka ''billaachatu'' natti dhagahama:
0		Baay'ee tti		3	Gonkumaa
1		Baay'ees miti		2	Yeroo tokko tokko
2		Xiqqoo qofa		1	Yeroo Baay'ee
3		Tasumaa rakkisaadha		0	Yeroo hundaa
703		Miira sodaa akka wanti hamaan tokko ta'uuf jedhutti natti dhaga'ama:		710	Bifa kootiif fedhii dhabeera:
	3	Baayyee hamaatu natti dhaga'ama	0		Dhugaadha
	2	Garuu baay'ee hamaa miti	1		Hanga of eeggannoo gochuu qabu hin godhu
	1	Xiqqoo, garuu na hin yaaddessu	2		Ani hamma tokko of eeggannoo nan godha
	0	Tasumaa iyyuu	3		Akkuma yeroo kaanii of eeggannoo nan godha
704		Wantootaan argutti kolfee qoosuu nan danda'a:		711	Sochii irra waanan jiruuf, boqonnaa dhabuun natti dhagahama:
0		Yeroo hundumaa		3	Baayyee dhuguma
1		Amma baay'ee miti		2	Baay'ee baay'eedha
2		Baayee xiqqoo dha		1	Baay'ee miti
3		Gonkuma iyyuu		0	Gonkumaa

705		Yaadonni na yaaddessaa ta'an sammuu keessa darbu:		712	Wantoota tokko tokko gammachuu fi hawwii guddaanin eeggadha:
	3	Yeroo hunduma	0		Akkuma yeroo kamiyyuu godhe
	2	Yeroo baay'ee	1		Kan duraan ture caalaa xiqqaadha
	1	Yeroo yerootti	2		Kan duraan ture irraa baayee xiqqaa dha
	0	Darbee darbee qofa	3		Tasumaa rakkisaadha
706		Gammachuun natti dhagahama:		713	Miira rifachuun akka tasaa natti dhagahama:
0		Tasumaa iyyuu		3	Yeroo baayyee dhuguma
1		Yeroo baay’ee miti		2	Yeroo baay’ee
2		Yeroo tokko tokko		1	Yeroo baayyee miti
3		Yeroo baay’ee		0	Tasumaa iyyuu
707		Tasgabbaa’ee taa’ee boqonnaan natti dhaga’amuu ni danda’a:		714	Kitaaba ykn sagantaa raadiyoo ykn TV gaarii ta’e tokkotti gammaduu nan danda’a:
	3	Dhugaadha	0		Yeroo baayyee
	2	Yeroo baay’ee	1		Yeroo tokko tokko
	1	Yeroo muraasa	2		Yeroo baay’ee miti
	0	Tasumaa iyyuu	3		Gonkuma iyyuu

Kutaa VI. Gaaffii of bulchuu beekumsa Asmii

Maaloo deebbii gaaffilee keessan wajjin kan walsimutti maruun filadha

801	Malli guddaan dhukkuba asmii ittisuuf gargaaru isaa kamii?	805	Karaan sirrii itti fayyadama safartuu yaa'a olka'aa (peak flow meter) kamii
	A. Nyaata nyaachuu dura qoricha fudhachuu B. Istirooyidii bifa kiniiniitiin fudhachuu C. Talaallii infuleenzaa argachuu D. Mallattoo jalqabaa irratti gara kutaa yaalaa hatattamaa deemuu E. Ani hin beeku		A. Hafuura dheeraa baafadhuu achiis suuta suutaan gara afaanitti afuufi B. Hafuura baafachuu jalqabi achiis afaan kee keessa kaa'i C Qaama afaanii afaan kee keessa kaa'i achiis afuura baafachuu fi hafuura baafachuu D. Hafuura dheeraa baafadhu sana booda hamma dandeessutti saffisaan gara afaanitti afuufi E. Ani hin beeku
802	Guyyaatti al lama meeshaa inhaler kee lama kan ajajame fudhachuu	806	Qorichoota baraarsaa kee:
	A. Guyyaatti si'a afur puff tokko fudhachuun walfakkaataadha B. Guyyaa tokko al tokko puff afur fudhachuun wal fakkaataadha C. Guyyaatti si'a afur hanga siif ta'utti fagootti qopheessuun ni danda'ama D. Naannoo biraa wajjin tokko miti E. Ani hin beeku		A. Guyyaatti yeroo sadii ykn afur ol fudhatamuu hin qabu B. Fuulduratti akka hin mul'anne gargaaruu C. Miidhaa cinaa hin qaban D. Qoricha akka obsa qabdu hin godhin E. Ani hin beeku
803	Yoo hin beekne mallattoo dhukkuba asmii qabaachuu kee	807	Yeroo inhaler kee fayyadamtu maal gochuu qabda?
	A. Sombi kee wantoota asmii kakasaniif carraa saaxilamuu hin qabu B. Qoricha doosiin wal fakkaatu dhabuu ni dandeessaa C. Kakaastoota dhibee asmii irraa fagaachuu qabda		A. Hafuura gadi fagoo fudhachuu B. Dafii afuura baafachuu C. Suuta suutaan afuura baafachuu D. Yeroo afuura baafachaa jirtutti meeshaa afuura baafachuu kee yeroo hedduu dhiibaa E. Ani hin beeku

	D. Dhukkuba asmiirra fayyaa taateetta E. Ani hin beeku		
804	Qorichoota suphaa(maintenance) ta'an	808	808. Erga inhaler kee fayyadamtee booda fayyadamuu maal gochuu qabda
	A. Mallattoo amala ittisuuf gargaara B. Guyyaa guyyaan akka hin fudhatamne C. Erga isaan fudhattee booda afuura kee fooyyessuu D. Bifa kiniinii qofaan fudhatamuu danda'a E. Ani hin beeku		A. Yeoo hedduudhaaf hafuura kee qabadhu B. Puff isa jalqabaa booda daftee puff lammaffaa fudhachuu C. Hanga miira gaarii sitti dhagahamutti puff fudhachuu itti fufi D. Inhaler tuubii bishaanii keessatti dhiqachuu E. Ani hin beeku
809	Yoo mallattoon Asmii si mudate garuu maaliif akka ta'e hin beektu ta'e	813	813 Dhukkuba Asmii fayyuu kan danda'u kamii?
	A. Qoricha isteeroyidii doosii tokko tokko fudhachuu B. Doktora keef bilbililu C. Saffisaan akka hafuura baafachaa jirtu lakkaaftaa D. Naannoo dhiyoo kee jijjiirtaa		A. Qoricha guyyaa guyyaan fudhachuu B. Trigger kan akka dafqa fi sigaaraa xuuxuu irraa fagaachuu C. Safartuu yaa'a olka'aa fayyadamuu D. Dhukkuba asmii kan fayyisuun beekamu hin jiru E. Ani hin beeku
810	Qoricha baraarsaa(rescuer) dabalataa fudhachuu ajaja:	814	Asmiin akkamitti namatti ka'a
	A. Guutummaatti miidhaa guutuu hin fidu B. Mallattoo tokko to'achuuf karaa gaarii dha C. Qoricha suphaa xiqqaa fudhachuu dandeessa jechuu ta'uu danda'a D. Qoricha suphaa dabalataa si barbaachisa jechuu ta'uu danda'a		A. Yeroo baayyee waan tokko malee akka tasaa uumama B. Yeroo kakaastuun xixiqqoo hedduuminan walitti qabaman uumamuu danda'a C. Miira cimaadhaan kakaafamuu hin danda'u D. Yeroo hunda 'wheezing' namatti fida E. Ani hin beeku

811	Faayidaan safartuu yaa'a olka'aa guyyaa guyyaan fayyadamuu	815	Yoo kiniinii isteeroyidii guyyoota torbaaf siif ajajame:
	A. Jijjiirama xiqqaa adda baasuu dandeessa B. Yoom qoricha kee hir'isuu akka dandeessu sitti himuu danda'a C. Hammam akka gaariitti hafuura baafachuu akka dandeessu arguu dandeessa D. Namoota biroo wajjin karaa itti of madaaltu qabaachuu dandeessa E. Ani hin beeku		A. Yeroo kiniinii fudhattu triggers irraa fagaachuu hin qabdu B. Yeroo kiniinii fudhattu mallattoon kee hammachuu hin danda'u C. Yeroo kiniinii fudhattu safartuu dhangala'aa olka'aa kee fayyadamuun si hin barbaachisu D. Qoricha yeroo dheeraaf fudhattee fooyyee yoo argatteyyuu doosii sana xumuruu qabda E. Ani hin beeku
812	Namoota dhukkuba asmii qabaniif sochii qaamaa:	816	Kanneen armaan gadii keessaa kamtu dhukkuba asmii to'achuuf gargaaruu danda'a?
	A. Waan hojjetamuu hin qabneedha B. Dandeettii hafuura baafachuu fooyyessuuf gargaaruu danda'a C. Yeroo tokkotti daqiiqaa 30 yoo hojjetame qofa gaarii dha D. Somba oksijiinii gahaa waan hin fudhanneef mallattoo kaasuu danda'a E. Ani hin beeku		A. Sadarkaa dhiphina hir'isuu B. Bishaan baay'ee dhuguun bishaan qaama keessaa akka hin dhumnee gochuu C. Nyaata salfeet qabu kan akka fuduraalee goggogaa fi wayinii irraa fagaachuu D. Hunduu deebii dha E. Ani hin beeku

Kutaa VII: Gaaffiiwwan ilaalcha dhukkubsataan dhukkuba asmii irratti qabu

Qajeelfama: Tokkoo tokkoo hima armaan gadii sirriitti dubbisiitii Likert iskeelii qabxii afur qabu 1 hanga 4 gidduutti ture filadhu; **1**= Cimsee walii hin galle, **2**= Walii hin galle, **3**= Giddu galeessa, **4**=Waliin gala, fi **5**= Baayisee cimseen walii gala.

Lak	Gaaffilee	1	2	3	4	5
901	Nyaata fayya qabeessaa fi akkaataa jireenyaa hordofuun dhukkuba asmii kee to'achuuf ni gargaara					
902	Qorichoota asmii keessan akka ajajametti fudhachuun keessan barbaachisaadha					
903	Maatiin kee yeroo dhukkubni asmii sitti dhaga'amu tasgabbii akka qabaattu si gargaaruu danda'u					
904	Of bulchuu asmii bu'a qabeessa ta'uu isa hubachuu ni dandeessa.					
905	Waa'ee dhukkuba asmii hamma beektutti of gargaaruu dandeessa					

Hirmaannaa keessaniif galatoomaa