

Knowledge and perception about asthma in a Nigerian university community

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ABSTRACT

Background: Asthma, a global health issue, affects people of all ages and backgrounds. There are some misconceptions about asthma. This study assessed the knowledge and perception about asthma in a Nigerian university community.

Methods: This cross-sectional study was conducted among students in University of Nigeria Nsukka on WAD 2021. A self-administered structured questionnaire was filled by conveniently sampled students in a strategic location on campus. Inferential statistics utilized the Pearson's Chi-Square test and multiple linear regression with $P < 0.05$ of statistical significance.

Results: One hundred and fifty-eight (158) students participated in the study. Majority of the participants were between the ages of 18 to 23 years ($n = 128$; 81.0%), in their first or second year of university ($n = 106$; 77.1%), and in Social Sciences or Arts ($n = 147$; 93.0%). Less than a tenth of the participants had been previously diagnosed of asthma ($n = 12$; 7.6%). Close to a quarter of them had a family history of asthma ($n = 37$, 23.4%). The awareness about asthma was high ($n = 155$; 98.1%). Less than half of the participants had good knowledge of asthma ($n = 52$; 32.9%) and positive perception of asthma ($n = 76$; 48.1%).

Conclusion: Majority of the students had high awareness about asthma but with poor knowledge of the disease. In addition, less than half of the participants had positive perceptions about asthma. These necessitate the need for health education on asthma.

1. Introduction

Asthma, a global health issue, affects people of all ages and backgrounds.¹ It is characterized by chronic inflammation of the airways which presents as shortness of breath, wheezing, coughing, chest tightness that vary in severity and frequency.² It affects more than 300 million people worldwide, placing a huge burden on families, societies and the healthcare system.^{3, 4} Evidence suggests that the prevalence of asthma has been increasing in Africa.⁵

The misconceptions on asthma and its management can lead to stigmatization of patients with asthma or prevent them from leading normal lives.^{1,6} Asthma misconceptions have been documented in literature. There are misconceptions that individuals can outgrow asthma; asthma is a communicable disease; asthma patients should not be involved in physical activities; asthma can only be controlled with high dose corticosteroids.⁷ From the identification of common misconceptions, it is easier to provide tailored education.⁸ Education can also be

provided to caregivers and the general population who can serve as first-responders when patients present symptoms of poorly-controlled asthma.

Previous studies have assessed respondents' knowledge and beliefs about asthma. A study conducted among final year pharmacy students in six pharmacy schools in Southern Nigeria revealed that less than half of the participants had good knowledge of asthma, favourable attitudes towards asthma and desirable perception of the roles of pharmacists in counselling asthma patients.⁹ In a study conducted in the Russian Federation, the level of knowledge of bronchial asthma among senior medical students was not satisfactory, with the level of incorrect answers to some basic questions hovering around 40%.¹⁰ Studies conducted among the general population, such as a cross-sectional survey which explored asthma knowledge and beliefs among African American adults in a Midwestern city, have reported some asthma-related misconceptions.¹¹

Health advocacy days for disease states could provide a channel to raise awareness about a disease, the disease burden and means for optimal management. The World Asthma Day (WAD), initiated by the Global Initiative for Asthma (GINA) in 1998, is widely celebrated in different countries of the world.^{4,12} The theme for World Asthma Day 2021, which held on Wednesday, 5th May, 2021 was, "Uncovering Asthma Misconceptions".^{4,12} Health promotional activities, organized in universities, that target a specific disease state could be beneficial since this setting hosts individuals from diverse backgrounds.

Studies have demonstrated that pharmacist-led interventions improve clinical outcomes in patients with asthma.¹³ Community pharmacists, based on accessibility, can increase asthma awareness through proactive health promotion.¹⁴ This research was spurred by the dearth of data on the possible misconceptions about asthma in Nigerian universities. This study, driven by pharmacists, was conducted on WAD 2021 to evaluate the knowledge and perception about asthma in a Nigerian university community.

2. Methods

2.1 Study design

This cross-sectional study was conducted in University of Nigeria Nsukka on World Asthma Day (WAD) which held on 5th May, 2021. There was an asthma awareness walk that commenced at the Students' Multi-purpose Building (9:00 am). The itinerary was through the Faculty of

Agriculture, Faculty of Veterinary Medicine, Faculty of Physical Sciences, Faculty of Engineering, Faculty of Biological Sciences, Faculty of Arts to the Faculty of Social Sciences. During the walk, members of the Asthma Awareness and Care Group (AACG) educated passersby who stopped to ask questions. AACG members who participated carried ten posters that bore these inscriptions: (i) Asthma can occur at any age (in children, adolescents, adults and elderly).

(ii) Asthma is not infectious.

(iii) When asthma is well-controlled, asthma subjects are able to exercise and even perform top sport.

(iv) Asthma is most often controllable with low dose inhaled steroids.

(v) Inhalers are not addictive.

(vi) Asthma is not only related to genetics.

(vii) Environmental factors such as air pollution can increase the prevalence of asthma.

(viii) Patients with asthma should know the triggers.

(ix) Symptoms of asthma differ from one patient to the other.

(x) Always tell your pharmacist you have asthma whenever you need medications.

The team arrived at the Faculty of Social Sciences close to 12:00 noon. There were talks on the theme of WAD 2021, "Misconceptions of asthma" in two radio stations in Nsukka, Voice FM 96.7 (9:00 am) and Lion FM 91.1 (4:00 pm).

The WAD 2021 Stand at the Faculty of Social Sciences Quadrangle had a projector stand where asthma videos were played. Asthma pamphlets were handed over to the participants on completion of the questionnaire. These pamphlets were also given to those who declined participation or were ineligible for participation.

2.2 Study setting

The University of Nigeria Nsukka (UNN) is located in Nsukka, the second-largest town in Enugu State, South-East, Nigeria. UNN is one of the first-generation federal tertiary institutions in Nigeria. There are two major campuses: Nsukka Campus and Enugu Campus. The study was conducted in Nsukka campus. The Nsukka campus which is the main campus hosts several Faculties and Institutes.

2.3 Ethical approval

The Health Research and Ethics Committee (HREC) of the University of Nigeria Teaching Hospital (UNTH), Ituku-Ozalla, Enugu State, approved the study protocol

(NHREC/05/01/2008B-FWA00002458-1RB00002323). Participation was voluntary. Participants were informed that they could withdraw from the study even after providing consent. Participants provided both written and oral consents.

2.4 Eligibility criteria

The inclusion criteria comprised students in UNN who were willing to participate. Non-students and members of staff were excluded from the study.

2.5 Sample size and selection

Participants were recruited by convenience sampling. The researchers had a WAD 2021 stand located at a strategic position on campus (Faculty of Social Sciences Quadrangle) between 12:00 noon and 2:00 pm. Only those who fell within the eligibility criteria within the time frame and provided consent were selected. The time frame was chosen as the researchers found that before 12:00 noon, most students had lectures. Lectures had either ended or students were moving to other classes by 12:00 noon, hence increased traffic by that time. Beyond 2:00 pm, students were more likely to be receiving lectures in their classrooms, having practical sessions in laboratories or retired to their hostels.

The researchers estimated that close to 500 students could walk past the WAD 2021 stand within the time frame. The Raosoft® sample size calculator was used to determine the minimum sample size required for the study. The sample size was calculated to be 218, with a 95% confidence level, 5% margin of error and assuming a 50% response distribution.

2.6 Data collection

This study utilized a self-administered structured questionnaire comprising four sections. The first section focused on demographic information of the participants. The second section assessed awareness about asthma, including sources of information about asthma. The third section was a 9-item scale that assessed knowledge of asthma with the options 'Yes' (coded as 1) or 'No' (coded as 2) or 'Not sure' (coded as 3). All correct options had their codes transformed to '1' while incorrect or not sure options were transformed to '0'. With the summation of the options, higher scores depicted better knowledge of asthma.

The last section was an 8-item scale that assessed perceptions about asthma on a five-point Likert scale of 'Strongly Disagree' (coded as 1), 'Disagree' (coded as 2), 'Neutral' (coded as 3), 'Agree' (coded as 4), and 'Strongly

Agree' (coded as 5). The scoring of the negatively-worded statements was reversed to 'Strongly Disagree' (coded as 5), 'Disagree' (coded as 4), 'Neutral' (coded as 3), 'Agree' (coded as 2), and 'Strongly Agree' (coded as 1), during analysis. Higher scores depicted more positive perceptions about asthma.

The questionnaire items were adapted from a previously validated instrument utilized in a Nigerian setting.¹⁵ Statements on the misconceptions about asthma commonly held in Nigeria were included in sections three and four. Participants filled the questionnaire without consulting any reference material. Confidentiality was maintained as their names were not requested for.

2.7 Data analysis

Data were analyzed using IBM SPSS Version 25.0. Descriptive statistics were used to summarize the data while Pearson's Chi-Square test was used to test the association between the demographic variables, knowledge and perception about asthma. The predictors for the knowledge of asthma and perception about asthma were determined using multiple linear regression. Statistical significance was set as $P < 0.05$.

3. Results

One hundred and fifty-eight (158) university students participated in the study. Majority of the participants were between the ages of 18 to 23 years ($n = 128$; 81.0%), in their first or second year of university ($n = 106$; 77.1%) and in the Social Sciences or Arts ($n = 147$; 93.0%). Less than a tenth of the participants had been previously diagnosed of asthma ($n = 12$; 7.6%). Close to a quarter of the participants had a family history of asthma ($n = 37$, 23.4%). See Table 1 for more details.

The awareness about asthma was high ($n = 155$; 98.1%) with the most common source being friends/peers ($n = 83$; 52.5%). More than four-fifths of the participants knew that asthma is a non-communicable disease ($n = 129$; 81.6%) and inhalers are commonly used in asthma management ($n = 150$; 94.9%). More than half of the participants knew that asthma-related deaths are preventable ($n = 123$; 77.8%) and exercise can be an asthma trigger ($n = 123$; 77.8%). Less than half of the participants knew that the severity of asthma can be measured ($n = 48$; 30.4%) and patients with asthma may experience different symptoms ($n = 60$; 38.0%). The total knowledge score was the sum of the correct options for the items testing knowledge of asthma. Higher scores indicated better knowledge of asthma. The maximum score obtainable was '9'. The cut point of '6' was the median score

of the respondents. Thus, knowledge was categorized as 'good' or 'poor' such that good knowledge of asthma referred to those with total knowledge scores ≥ 7 . Overall, less than half of the participants had good knowledge of asthma (n = 52; 32.9%), Table 2.

More than half of the participants disagreed that the use of inhaler in class during an asthma attack is embarrassing (n = 123; 77.9%). Majority of the participants agreed that school authorities should know the students that have asthma (n = 138; 87.3%). The total perception score was the sum of the scores for the eight items that assessed perceptions about asthma. Higher scores indicated more positive perceptions about asthma. The codes for negatively-phrased statements (items 2, 4, 6, 7 and 8) were reversed. The maximum score

obtainable was '40'. The cut point of '32' was the median score of the respondents. Thus, perception was categorized as 'positive' or 'negative' such that positive perception of asthma referred to those with total perception scores ≥ 33 . Overall, less than half of the participants had positive perception of asthma (n = 76; 48.1%), Table 3.

A larger proportion of students in 100 Level and 200 Level were aware about asthma compared to those in higher years of study ($\chi^2 = 53.506$; $P < 0.001$), Table 4.

The combination of the variables did not significantly predict knowledge of asthma ($F = 0.298$, $P = 0.913$) or perceptions about asthma ($F = 0.276$, $P = 0.926$), Table 5 and Table 6.

Table 1: Demographic Information, N = 158

Variables	n (%)
Age (in years)	
18 – 20	70 (44.3)
21 – 23	58 (36.7)
24 – 26	21 (13.3)
27 – 29	3 (1.9)
> 29	6 (3.8)
Year of study	
100 Level	66 (41.8)
200 Level	40 (25.3)
300 Level	26 (16.5)
400 Level	25 (15.8)
500 Level	1 (0.6)
Discipline	
Social sciences	98 (62.0)
Arts	49 (31.0)
Sciences	11 (7.0)
I have been previously diagnosed with asthma	12 (7.6)
I have an immediate family member/relative with asthma	37 (23.4)

Table 2: Awareness and knowledge of asthma, N = 158

Variables	n (%)
Awareness about asthma	
<i>I have heard about asthma</i>	155 (98.1)
<i>Sources of information about asthma</i>	
1. Teacher/Lecturer	57 (36.1)
2. Health professionals	72 (45.6)
3. Family members/relatives	53 (33.5)
4. Newspapers/magazines	44 (27.8)
5. Friends/peers	83 (52.5)
6. Television/radio	57 (36.1)
7. None	3 (1.9)
Knowledge of asthma	
	Correct (%)
1. † Asthma is a communicable disease	129 (81.6)
2. † Asthma is a disease of the digestive system	112 (70.9)
3. Asthma-related deaths are preventable	123 (77.8)
4. † Shortness of breath is not a symptom of asthma	108 (68.4)
5. Exercise can be an asthma trigger	123 (77.8)
6. Inhalers are commonly used in asthma management	379 (97.7)
7. † The severity of asthma cannot be measured	150 (94.9)
8. † Everyone with asthma experiences the same symptoms	60 (38.0)
9. † Asthma could be completely cured	54 (34.2)

† Correct option is reversed

The total knowledge score was the sum of the correct options for the items testing knowledge of asthma, with a maximum score of '9'.

Knowledge was categorized as *good* or *poor* such that good knowledge of asthma referred to those with total knowledge scores ≥ 7 (median score was '6').

Less than half of the participants had good knowledge of asthma (n = 52; 32.9%).

Table 3: Perceptions about asthma, N = 158

Variables	Strongly Disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly Agree n (%)
1. Asthma is a common disease	15 (9.5)	59 (37.3)	43 (27.2)	37 (23.4)	4 (2.5)
2. † It is embarrassing to use your inhaler in class due to an asthma attack	81 (51.3)	42 (26.6)	13 (8.2)	15 (9.5)	7 (4.4)
3. An asthmatic patient with well-controlled asthma can participate in sports	19 (12.0)	54 (34.2)	40 (25.3)	34 (21.5)	11 (7.0)
4. † Asthma only affects children	98 (62.0)	42 (26.6)	9 (5.7)	7 (4.4)	2 (1.3)
5. School authorities should know the students that have asthma	6 (3.8)	7 (4.4)	7 (4.4)	53 (33.5)	85 (53.8)
6. † If you have asthma, it is better not to let anyone know about it	107 (67.7)	32 (20.3)	9 (5.7)	5 (3.2)	5 (3.2)
7. † Asthma is a spiritual problem	108 (68.4)	26 (16.5)	17 (10.8)	3 (1.9)	4 (2.5)
8. † I have no role to play in helping asthma patients	90 (57.0)	37 (23.4)	14 (8.9)	9 (5.7)	8 (5.1)

Strongly Disagree (coded as '1'); Disagree (coded as '2'); Neutral (coded as '3'); Agree (coded as '4'); Strongly agree (coded as '5')

† Reversed Items such that: Strongly Disagree (coded as '4'); Disagree (coded as '3'); Neutral (coded as '3'); Agree (coded as '2'); Strongly agree (coded as '1')

The total perception score was the sum of the scores for the different items, with a maximum score of 40.

Perception was categorized as *positive* or *negative* such that positive perception about asthma referred to those with total perception scores ≥ 33 (median score was 32).

Less than half of the participants had positive perception of asthma (n = 76; 48.1%).

Table 4: Association between demographic information, awareness, knowledge and perception about asthma, N = 158

Variables	Awareness		χ^2	P-value	Knowledge		χ^2	P-value	Perception		χ^2	P-value
	Yes n (%)	No n (%)			Poor n (%)	Good n (%)			Negative n (%)	Positive n (%)		
Age (in years)			7.935	0.094			4.882	0.300			2.968	0.563
18 – 20	69 (98.6)	1 (1.4)			48 (68.6)	22 (31.4)			3 (4.3)	67 (95.7)		
21 – 23	58 (100.0)	0 (0.0)			38 (65.5)	20 (34.5)			1 (1.7)	57 (98.3)		
24 – 26	19 (90.5)	2 (9.5)			15 (71.4)	6 (28.6)			2 (9.5)	19 (90.5)		
27 – 29	3 (100.0)	0 (0.0)			3 (100.0)	0 (0.0)			0 (0.0)	3 (100.0)		
> 29	6 (100.0)	0 (0.0)			2 (33.3)	4 (66.7)			0 (0.0)	6 (100.0)		
Year of study			53.506	< 0.001*			2.695	0.610			2.371	0.668
100L	65 (98.5)	1 (1.5)			43 (65.2)	23 (34.8)			2 (3.0)	64 (97.0)		
200L	40 (100.0)	0 (0.0)			28 (70.0)	12 (30.0)			2 (5.0)	38 (95.0)		
300L	25 (96.2)	1 (3.8)			15 (57.7)	11 (42.3)			2 (7.7)	24 (92.3)		
400L	25 (100.0)	0 (0.0)			19 (76.0)	6 (24.0)			0 (0.0)	25 (100.0)		
500L	0 (0.0)	1 (100.0)			1 (100.0)	0 (0.0)			0 (0.0)	1 (100.0)		
Discipline			4.014	0.134			1.828	0.401			3.818	0.148
Social Sciences	96 (98.0)	2 (2.0)			64 (65.3)	34 (34.7)			2 (2.0)	96 (98.0)		
Arts	49 (100.0)	0 (0.0)			36 (73.5)	13 (26.5)			4 (8.2)	45 (91.8)		
Sciences	10 (90.9)	1 (9.1)			6 (54.5)	5 (54.5)		0.001	0 (0.0)	11 (100.0)	0.513	0.474
Asthma diagnosis			0.251	0.616				0.974				
Yes	12 (100.0)	0 (0.0)			8 (66.7)	4 (33.3)			0 (0.0)	12 (100.0)		
No	143 (97.9)	3 (2.1)			98 (67.1)	48 (32.9)			6 (4.1)	140 (95.9)		
Family member/relative with asthma			0.935	0.334			0.005	0.944			0.159	0.691
Yes	37 (100.0)	0 (0.0)			25 (67.6)	12 (32.4)			1 (2.7)	36 (97.3)		
No	118 (97.5)	3 (2.5)			81 (66.9)	40 (33.1)			5 (4.1)	116 (95.9)		

* P < 0.05 is statistically significant

Table 5: Predictors for knowledge of asthma, N = 158

Variables	Unstandardized Coefficient (B)	Unstandardized Coefficient (Standard Error)	Standardized Coefficient (Beta)	t	P-value
Constant	5.574	0.221		25.274	<0.001
Age	0.143	0.296	0.043	0.481	0.631
Year of study	0.087	0.311	0.025	0.279	0.781
Discipline	-0.059	0.530	-0.009	-0.111	0.911
Asthma diagnosis	0.387	0.528	0.062	0.733	0.465
Family member/relative with asthma	0.140	0.331	0.036	0.424	0.672

Note: R = 0.099; R² = 0.010; Adjusted R² = -0.023; F (5, 152) = 0.298, P = 0.913

*P < 0.05

All variables are transformed:

Age: 18 - 20 years coded as '0', ≥ 21 years coded as '1'; **Year of study:** 100L and 200L coded as '0', 300L, 400L and 500L coded as '1'; **Discipline:** Social sciences and Arts coded as '0', Sciences coded as '1' **Asthma diagnosis:** No coded as 0, Yes coded as 1; **Family member/relative with asthma:** No coded as 0, Yes coded as 1.

Table 6: Predictors of perception about asthma, N = 158

Variables	Unstandardized Coefficient (B)	Unstandardized Coefficient (Standard Error)	Standardized Coefficient (Beta)	t	P-value
Constant	31.823	0.515		61.817	<0.001
Age	0.030	0.692	0.004	0.043	0.966
Year of study	0.067	0.726	0.008	0.093	0.926
Discipline	0.269	1.237	0.018	0.217	0.828
Asthma diagnosis	-1.283	1.232	-0.089	-1.042	0.299
Family member/relative with asthma	0.602	0.772	0.066	0.780	0.437

Note: R = 0.095; R² = 0.009; Adjusted R² = -0.024; F (5, 152) = 0.276, P = 0.926

*P < 0.05

All variables are transformed:

Age: 18 - 20 years coded as '0', ≥ 21 years coded as '1'; **Year of study:** 100L and 200L coded as '0', 300L, 400L and 500L coded as '1'; **Discipline:** Social sciences and Arts coded as '0', Sciences coded as '1' **Asthma diagnosis:** No coded as 0, Yes coded as 1; **Family member/relative with asthma:** No coded as 0, Yes coded as 1.

4. Discussion

There was high awareness about asthma with the most common source being friends/peers. Overall, less than half of the participants had good knowledge of asthma and positive perception about asthma.

Less than a tenth of the participants had been previously diagnosed of asthma while close to a quarter of the participants had a family history of asthma. Both maternal and paternal histories of asthma are associated with increased risk of asthma in offspring but maternal asthma history is more strongly associated with asthma development in children.¹⁶ The diagnosis of asthma and assessment of severity in young adults should include objective measures of airway obstruction, airway hyperresponsiveness, presence of atopy and not merely restricted to history taking and clinical examination.¹⁷ Health professionals need to understand that even patients with asthma may overestimate their symptom control and underestimate the severity of their condition.^{18,19}

The awareness about asthma was high with the most common source being friends/peers, followed closely by health professionals. One might expect healthcare professionals to be more credible sources. However, healthcare professionals are majorly accessed in hospitals, clinics, pharmacies or when they engage in clinical outreaches. The internet was not mentioned as a source of information about asthma. The use of the internet has increased many folds worldwide and is widely utilized by young adults.²⁰ The internet is not all negative as it may support patient self-management of chronic conditions.²¹ Patients with asthma have reported to resort to online sources such as search engines, health-related websites and social media for information about asthma.²¹ Thus, providing individuals with access to reliable websites on asthma may increase their level of understanding of the disease and help improve asthma control.²²

More than four-fifths of the participants knew that asthma is a non-communicable disease and inhalers are commonly used in asthma management. Communicable diseases could arouse fear because of the concerns about transmissibility.²³ However, with non-communicable diseases, such as asthma, there could be concerns such as passing the disease to future offspring through marriage or stigma associated with the use of inhalers in the public.²⁴ Stigmatization could reduce when the public are knowledgeable about asthma and the devices commonly used for drug delivery in the management of the disease. Patients with asthma could be better controlled as they

would not be averse to using their inhalers in school, at work or anywhere necessary.²⁵ More than half of the participants disagreed that the use of inhaler in class during an asthma attack is embarrassing. Majority of the participants agreed that school authorities should know the students that have asthma. If university students and staff know students with asthma, they could not only provide an enabling environment by eliminating asthma triggers but also provide support when students with asthma are poorly-controlled.

More than half of the participants knew that asthma-related deaths are preventable and exercise can be an asthma trigger. In recent decades, asthma morbidity and mortality has been on the decline since the introduction of inhaled corticosteroids for the management of asthma.²⁶ The inappropriate use of beta agonists drugs can induce tolerance, increase airway hyperresponsiveness and increase the risk of asthma death.²⁷ Understanding that deaths from asthma can be prevented can lead to informed decisions. Sporting activities are common in universities. Sudden fatal asthma exacerbations can occur in both competitive and recreational sports.²⁸ Patients with asthma can lead normal lives without limitation of their daily activities if they are well-controlled.²⁹

Less than half of the participants knew that the severity of asthma can be measured and patients with asthma may experience different symptoms. There are different methods of classifying asthma severity with each method having its limitations.³⁰ However, there is need for objective assessment of lung function as patients might not reliably detect changes in their lung function.³¹ Clinical history and spirometry can be used to determine asthma severity.³² The severity and frequency of the symptoms of asthma vary among individuals.³³

The findings of this study should be generalized with caution as it was cross-sectional by design, self-reported, and conducted in a tertiary institution. The location of the WAD stand could have also influenced the responses, as participants were majorly in Social Sciences and Arts. The study provides evidence for Pharmacists' involvement in health promotion and research on world advocacy days.

5. Conclusion

Majority of the students had high awareness about asthma but with poor knowledge of the disease. In addition, less than half of the participants had positive perceptions about asthma. These findings stress the need to address the misconceptions about asthma and improve the knowledge of asthma in tertiary institutions. In addition, the findings

demonstrate that pharmacists can be actively involved in health promotional activities on world advocacy days, like World Asthma Day.

CONFLICTS OF INTEREST

The authors have no conflict of interest to declare.

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