



## Adolescents' Health Literacy Level of Asthma Due Environmental, Physical and Medical Conditions

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### ABSTRACT

**Study Focus:** This study only aimed at the assessment and evaluation of adolescents' health literacy level of asthma due environmental, physical and medical conditions, cased at four selected senior high schools in Bo, Southern Sierra Leone.

**Methods:** The restructured adolescents' health literacy level questionnaire (AHLQ) was adopted as measuring instrument, and the option variables were tested using One-sample t-Test of IBM-SPSS Statistics (Version 23). A sampled size of one hundred and twenty participants ( $n=120$ ) of mean and SD age of  $[16.5\pm 3.5]$  ranged from (13-20) years, were selected using the simple random sampling method.

**Results:** The comparative analysis from the test results showed significance difference in scores for all tested and evaluated option variables with t-scores of  $[07.682\text{-}\&18.548]$  in table 2;  $[08.318\text{-}\&16.647]$  in table 4; and  $[06.975\text{-}\&22.081]$  in table 6 respectively, @  $*p<0.000$  and  $**p<0.001$  level of 2-tailed significance with test-value of 0.05.

**Conclusion and Recommendation:** A significant difference was observed between the simple [Yes] and/or a simple [No] scores for all tested and evaluated option variables investigated, indicating the sampled adolescents' low level of health literacy as slated also in their mean scores, percentages, grouped frequencies and 95% confidence interval difference scores. Immunization and introduction of health literacy in health and physical education classes in all senior high schools were recommended.

### KEYWORDS

Health Literacy, Asthma, Environmental, Physical and Medical Conditions

### Introduction:

Asthma is a common long term inflammatory disease of the airways of the lungs, *Asthma Fact Sheet N°307 WHO (2013)*. It is characterized by variable and recurring symptoms, reversible airflow obstruction, and bronchospasm, *National Asthma Education and Prevention Program (2007)*. Symptoms include episodes of wheezing, coughing, chest tightness, and shortness of breath, *British Guideline (2008)*. These episodes may occur a few times a day or a few times per week depending on the person, which may become worse at night or with exercise, *Asthma Fact Sheet N°307 WHO (2013)*.

Asthma is thought to be caused by a combination of genetic and environmental factors, *Martinez, F. D. (2007)*. Environmental factors include exposure to air pollution and allergens, *Asthma Fact Sheet N°307 WHO (2013)*. Other potential triggers include medications such as aspirin and beta blockers, *Asthma Fact Sheet N°307 WHO (2013)*.

Diagnosis of asthma is usually based on the pattern of symptoms, response to therapy over time, and spirometry, *Lemanske, R. F. et al. (2010)*. Asthma, is classified according to the frequency of symptoms, forced expiratory volume in one second (FEV1), and peak expiratory flow rate (PEFR), *Yawn, B. P. (2008)*. It is also being classified as atopic or non-atopic, where atopy refers to a predisposition toward developing a type 1 hypersensitivity reaction, *Kumar, V. et al. (2010)*.

There is no cure for asthma, *Asthma Fact Sheet N°307 WHO (2013)*. Symptoms can be prevented by avoiding triggers, such as allergens and irritants, and by the use of inhaled corticosteroids, *National Asthma Education and Prevention Program (2007)*. Long-acting beta agonists (LABA) or antileukotriene agents may be used in addition to inhaled corticosteroids if asthma symptoms remain uncontrolled, *Scott, J. P. et al. (2013)*.

Treatment of rapidly worsening symptoms is usually with an inhaled short-acting beta-2 agonist such as salbutamol and corticosteroids taken by mouth, *National Asthma Education and Prevention Program (2007)*. In very severe cases, intra-

venous corticosteroids, magnesium sulfate, and hospitalization may be required, *National Asthma Education and Prevention Program (2007)*.

In 2013, 242 million people globally had asthma up from 183 million in 1990, *GBD Study 2013, Collaborators (2015)*. It caused about 489,000 deaths in 2013, *GBD 2013 Mortality and Causes of Death, Collaborators (2015)* most of which occurred in the developing world and often begins in childhood, *Asthma Fact Sheet N°307 WHO (2013)*.

This study only aimed at the assessment and evaluation of adolescents' health literacy level of asthma due environmental, physical and medical conditions, cased at four selected senior high schools in Bo, Southern Sierra Leone.

### Materials and Methods

#### Survey Participants:

The researcher interviewed mainly pupils from senior high schools in Bo with a sampled size of one hundred and twenty ( $n=120$ ), with a mean and standard deviation age of  $[16.5\pm 3.5]$  within the range of (13-20) years, were selected using the simple random sampling method from [SSS-1-to-2] and [SSS-3-to-4].

#### Measuring Instrument:

The restructured adolescents' health literacy level questionnaire (AHLQ) was adopted and validated as a survey instrument for testing the parameters, which was formally used by *Bebeley, et al. (2016)*, and was pre-tested on forty pupils ( $n=40$ ) from USS Njala, using the test retest analysis of variance (ANOVA) technique, producing an intra-class correlation coefficient reliability (ICCR) ranged from  $[0.78\text{-}to\text{-}0.86]$ .

#### Test Procedure:

The one hundred and twenty participants ( $n=120$ ) were each issued with a questionnaire and instructed by the researcher to only mark a simple [Yes] and/or a simple [No] during the test and evaluation process regarding their health literacy

level with respect to the option variables under investigation on their schools' premises adopting the process of classroom face-to-face technique.

**Data Analysis:**

The frequency, percentage, standard deviation (SD), mean, 95% confidence interval difference and One-Sample t-Test from IBM-SPSS Statistics (**Version 23**), were used to compute, analyze and compare the results of the finding from the tested and evaluated option variables. The results of the finding were tested and evaluated @ 2-tailed significance of \***p<0.000** and \*\***p<0.001**.

**Table 1: Adolescents Health Literacy of Asthma Due Environmental Conditions [n=120]**

Do you Know that Asthma Due Environmental Conditions can be Linked to:	Yes		No	
	n	%	n	%
Environmental Air Pollution?	45	38	75	63

Smoking During Pregnancy and After Delivery?	33	28	87	73
Low Air Quality from Traffic Pollution?	28	23	92	77
Exposure to Indoor Allergens Like Dust Mites?	31	26	89	74
Respiratory Syncytial Virus Infections?	22	18	98	82
Endotoxin Exposure Like Tobacco Smoke?	52	43	68	57

**Test Results:**

**Table 2: One-Sample t-Test for Asthma Literacy Due Environmental Conditions [n=120]**

Vab (V)	Freq. (F)	% Scores	Mean Scores	Std. Dev.	t-Test Scores	Sig. 2-tailed	95% CID	
							Lower	Upper
Yes	211	29.0	35.1667	11.19673	07.682	0.001	23.3664	46.8669
No	509	71.0	84.8333	11.19673	18.548	0.000	73.0331	96.5336

**Note: 95%CID = 95% Confidence Interval Difference; df=5; n=6; Test-Value=0.05; Vab=Variable**

**Table 3: Adolescents Health Literacy of Asthma Due Physical Conditions [n=120]**

Do you Know that Asthma Due Physical Conditions can be Linked to:	Yes		No	
	n	%	n	%
Episodes of Wheezing?	36	30	84	70
Shortness of Breath?	57	48	63	53
Chest Tightness and Coughing?	49	41	71	59
Childhood Exposure to Pathogenic Bacteria and Viral?	33	28	87	73
Decreased Cleanliness and Increased Family Size?	41	34	79	66
Use of Antibiotics in Early Life?	24	20	96	80

**Table 4: One-Sample t-Test for Asthma Literacy Due Physical Conditions [n=120]**

Vab (V)	Freq. (F)	% Scores	Mean Scores	Std. Dev.	t-Test Scores	Sig. 2-tailed	95%CID	
							Lower	Upper
Yes	240	33.3	40.0000	11.76435	08.318	0.000	27.6041	52.2959
No	480	66.7	80.0000	11.76435	16.647	0.000	67.6041	92.2959

**Note: 95%CID = 95% Confidence Interval Difference; df=5; n=6; Test-Value=0.05; Vab=Variable**

**Table 5: Adolescents Health Literacy of Asthma Due Medical Conditions [n=120]**

Do you Know that Asthma Due Medical Conditions can be Linked to:	Yes		No	
	n	%	n	%
Atopic Disease?	18	15	102	85
Eczema or Hay Fever?	22	18	98	82
Obesity and Increased Body Size?	39	33	81	68
Beta Blocker Medications Like Propranolol?	20	17	100	83
Obstructive Sleep Apnea?	41	34	79	66
Psychological Disorders (Anxiety and Mood)?	33	28	87	73

**Table 6: One-Sample t-Test for Asthma Literacy Due Medical Conditions [n=120]**

Vab (V)	Freq. (F)	% Scores	Mean Scores	Std. Dev.	t-Test Scores	Sig. 2-tailed	95%CID	
							Lower	Upper
Yes	173	24.0	28.8333	10.10775	06.975	0.001	18.1759	039.3908
No	547	76.0	91.1667	10.10775	22.081	0.000	80.5092	101.7241

**Note: 95%CID = 95% Confidence Interval Difference; df=5; n=6; Test-Value=0.05; Vab=Variable**

### Discussion:

While there is no cure for asthma, symptoms can typically be improved, *Ripoll, B. C. et al. (2011)*. A specific, customized plan for proactively monitoring and managing symptoms should be created. This plan should include the reduction of exposure to allergens, testing to assess the severity of symptoms, and the usage of medications, *Ripoll, B. C. et al. (2011)*.

The comparative results of the finding from the grouped frequency of respondents' health literacy level of all tested and evaluated variables during the simple [Yes] and/or a simple [No] testing and evaluation process for asthma due environmental conditions, as recorded in table two, physical conditions, as recorded in table four and medical conditions, as recorded in table six, showed a significance difference in their respective grouped scores.

The significant difference in the t-Test scores and 95% confidence interval difference scores clearly recorded between the simple [Yes] and/or a simple [No] results of the finding indicated very strongly, the low level of adolescents' health literacy of asthma with reference to the tested and evaluated option variables among the sampled participants within the scope of study during the research process in health and physical education class.

The significant difference was also well noticed in their individually computed, analysed and compared scores and percentages slated in table one, table three and table five respectively, displaying and supporting considerably the low level of adolescents' health literacy, referencing the tested and evaluated option variables within the study scope.

In similar research, *Been, J. V. et al. (2014)* reported in their findings that, smoking bans are effective in decreasing exacerbations of asthma. Hence, the most effective treatment for asthma according to *British Guideline (2008)*, is identifying triggers, such as cigarette smoke, pets, or aspirin, and eliminating exposure to them.

But if trigger avoidance is insufficient according to *British Guideline (2008)*, the use of medication is recommended and that pharmaceutical drugs are selected based on, among other things, the severity of illness and the frequency of symptoms which can be broadly classified into fast-acting and long-acting categories.

As reported by *Thomson, N. C. et al. (2005)*, avoidance of triggers like allergens, smoke (tobacco and other), air pollution, non-selective beta-blockers and sulfite-containing foods is a key component of improving control and preventing attacks.

*Stapleton, M. et al. (2011)* reported that, cigarette smoking and second-hand smoke (passive smoke) may reduce the effectiveness of medications such as corticosteroids, and that laws that limit smoking according to *Been, J. (2014)*, decreases the number of people hospitalized for asthma. *Carson, K. V. et al. (2013)* however, noted that, exercise is beneficial in people with stable asthma.

### Conclusion and Recommendation:

Based on the results of the finding, it is concluded that, a significant difference was observed between the simple [Yes] and/or a simple [No] scores for all tested and evaluated option variables as evidenced and slated in their comparative percentages, 95% confidence interval difference scores and calculated t-values, showing a considerable low level of adolescents' health literacy of asthma due environmental, physical and medical conditions.

Immunization; however, is recommended by the WHO, *Strategic Advisory Group of Experts on Immunization (2009)*, and it is also strongly recommended by the researcher that, health literacy be introduced as a topic in health and physical

education classes in all senior high schools within and outside the scope of study as a fundamental factor in bringing up to speed adolescents, with regards teaching and learning to improve their basic health literacy level.

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### References:

1. Asthma Fact Sheet N°307. *World Health Organization* (2013). Retrieved (2016). <http://www.who.int/mediacentre/factsheets/fs307/en/>
2. Bebeley, S. J. et al. (2016). Knowledge of Njala Campus Athletes about Abstinence from Diseases Associated with Unsafe Sexual Practices such as Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome (HIV/AIDS), Gonorrhoea (GR) and Syphilis (SP), aimed as Primary Prevention Strategy in Minimizing the Process of Ageing. *Journal of Exercise Science and Physiotherapy*: **12** (1): 42-56.
3. Been, J. V., Nurmatov, U. B., Cox, B., Nawrot, T. S., van Schayck, C. P. and Sheikh, A. (2014). Effect of smoke-free legislation on perinatal and child health: a systematic review and meta-analysis. *Lancet* **383** (9928): 1549-60.
4. British Guideline on the Management of Asthma (PDF) (2008). Scottish Intercollegiate Guidelines [http://www.rcpch.ac.uk/sites/default/files/asset\\_library/BTS%20SIGN%20Asthma/BTS%20SIGN.%20Asthma%20QRG.%20FINAL.%202009.pdf](http://www.rcpch.ac.uk/sites/default/files/asset_library/BTS%20SIGN%20Asthma/BTS%20SIGN.%20Asthma%20QRG.%20FINAL.%202009.pdf)
5. Carson, K. V., Chandratilleke, M. G., Picot, J., Brinn, M. P., Esterman, A. J. and Smith, B. J. (2013). Physical training for asthma. *The Cochrane data base of systematic reviews* **9**: CD001116.
6. GBD Study 2013 Collaborators (2015). A systematic analysis for the Global Burden of Disease Study. *Lancet (London, England)* **386** (9995): 743-800.
7. GBD 2013 Mortality and Causes of Death, Collaborators (2015). A systematic analysis for the Global Burden of Disease Study 2013. *Lancet (London, England)* **385** (9963): 117-71.
8. Global Strategy for Asthma Management and Prevention (PDF) (2011). Global Initiative for Asthma [http://www.who.int/respiratory/asthma/GINA\\_WR\\_2006\\_copyright%5B1%5D.pdf](http://www.who.int/respiratory/asthma/GINA_WR_2006_copyright%5B1%5D.pdf)
9. Kumar, Vinay; Abbas, Abul K; Fausto, Nelson; Aster, Jon, eds. (2010). *Robbins and Cotran pathologic basis of disease* (8th ed.). Saunders. p. 688. ISBN 978-1-4160-3121-5.
10. Lemanske, R. F. and Busse, W. W. (2010). Asthma: clinical expression and molecular mechanisms. *J. Allergy Clin. Immunol.* **125** (2 Suppl 2): S95-102.
11. Martinez, F. D. (2007). Genes, environments, development and asthma: a reappraisal". *European Respiratory Journal* **29** (1): 179-84.
12. National Asthma Education and Prevention Program (PDF) (2007). Expert Panel Report 3: *Guidelines for the Diagnosis and Management of Asthma*. <http://www.nhlbi.nih.gov/files/docs/guidelines/asthsumm.pdf>
13. Ripoll, Brian C. Leutholtz, Ignacio (2011). *Exercise and disease management* (2nd ed.). Boca Raton: CRC Press. p. 100. ISBN 978-1-4398-2759-8.
14. Scott, J. P. and Peters-Golden, M. (2013). Antileukotriene agents for the treatment of lung disease. *Am. J. Respir. Crit. Care Med.* **188** (5): 538-544.
15. Stapleton, M., Howard-Thompson, A., George, C., Hoover, R. M. and Self, T. H. (2011). Smoking and asthma. *J Am Board Fam Med* **24** (3): 313-22.
16. Strategic Advisory Group of Experts on Immunization – report of the extraordinary meeting on the influenza A (H1N1) pandemic, (2009). *Wkly Epidemiol Rec* **84** (30): 301-4.
17. Thomson, N. C. and Spears, M. (2005). The influence of smoking on the treatment response in patients with asthma. *Current Opinion in Allergy and Clinical Immunology* **5** (1): 57-63.
18. Yawn, B. P. (2008). Factors accounting for asthma variability: achieving optimal symptom control for individual patients. *Primary Care Respiratory Journal* **17** (3): 138-147.