Factors That Influence JHS/SHS Students Reactions to Dementia in Ghana And How Educating Them Will Promote Future Awareness of Dementia

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Abstract— **Dementia, due to its unorthodox nature in the Ghanaian society, is being misinterpreted by many Ghanaians. It is believed that these reactions are on the grounds of superstition and ignorance (lack of teachings on the topic). This study therefore sought to identify whether superstition and ignorance are the main factors of this misinterpretation and prove how educating JHS/SHS will significantly help. This study logically and justifiably centered on JHS/SHS students employed quantitative and statistical approaches. 180 students from different schools were selected for the study. An interviewer guided questionnaire was used to collect their responses and analyzed mathematically using frequency tablesand the multiple linear regression techniques assisted by STATA. Out of the respondents, 100 (55.56%) were JHS students and 80 (44.44%) were SHS students. The study found that 133 out of the 180 students (73.89%) believe in superstitions and a bulk of 151 (83.89%) had no idea about dementia. The multiple linear regression model was run on the data and statistically significant values were recorded: ignorance (t=2.10, P=0.037) and superstition (t=-3.09, P=0.002). These values mathematically prove that there is a relationship between the reactions of the respondents toward dementia and the factors. Also based on calculations and logic in the discussion section, educating JHS/SHS students will increase the awareness of dementia in the country to about the whole population in the next 45 years.**

Index Terms— **awareness, dementia, education, ignorance, superstition.**

I. INTRODUCTION

This research title features "Dementia" as the topic of study. However, dementia in this study refers to all dementia-related diseases i.e., neurodegenerative diseases like Alzheimer, Parkinsons, Lou Gehrig's etc. In September 2022, 44 million people worldwide were diagnosed with Dementia-related diseases and 76 million people are projected to be diagnosed as well in 2030 (ARDG, 2022). Ghana has had its fair share in these numbers. As of 2020, 5.7 thousand people were documented to be dementia patients in Ghana (Statista, 2022). Since this disease is somehow new and unorthodox in the country, little research has been done about it and insignificant education has been offered to the public. Currentlythe Government Policy makers and many NGO's (both in Ghana and outside) are directing huge amounts of money to increase the awareness of Dementia. This study, given the problem, seeks to confirm the factors of Dementia unawareness and suggest the most efficient way and

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long-term plan to make the future population aware of the disease.

Ghana is one of the countries where superstition is endemic (Lucy et. al, 2020) and therefore blinds most of the population into regarding new issues as supernatural or unexplainable. This is believed to influence how people will react to the disease if they have no idea about it. JHS/SHS students even though enrolled in modern scientific educational systems are not free from these superstitions themselves. Therefore, it is only logical to assume that superstition will influence their reactions to the disease. Ignorance, which is the lack of education and teaching or the exposure of the public to knowledge about the disease is also undoubtedly another factor to consider as a person cannot make an informed decision on or interpret a topic that he/she has no idea about. This study therefore uses mathematical models to examine and confirm whether indeed, these factors are responsible for the reactions of the students toward dementia.

II. EXPERIMENTAL

A. Sample Size Determination

The Cochran's formula (Cochran,1963) which is $N=Z^2*p*q/d^2$ was used to calculate the number of SHS and JHS students which will standardize the findings.

For JHS students:

Z=1.96; the value of z corresponding to the 95% confidence level

p=0.06578; the percentage of the population who are JHS students (PHC Reports on Literacy and Education,2021)

q=0.93413 and d=0.05; corresponding to 95% confidence interval

From these values, N=94.55~95

However, the value was adjusted to 100 to compensate for some unnoticeable errors.

For SHS students:

Z=1.96, the value of z corresponding to the 95% confidence level

p=0.050898; the percentage of the population who are SHS students (PHC Reports on Literacy and Education,2021)

q=0.949102; and d=0.05; corresponding to 95% confidence interval

From these values, N=74.23~75

However, the value was adjusted to 80 to compensate for some unnoticeable errors.

B. Sampling and Data Collection

From Taherdoost,2020, a selected sample should be that it represents the interest of the whole population. In view of that,

the number of students was further calculated such that 105 (~58%) will be from Urban schools and the rest from Rural schools (PHC Reports on Urbanization,2010). Opoku Ware School was chosen for the Urban SHS, and 45 students were interviewed whilesEjisuman Senior High School was chosen for the Rural SHS, and 35 students were interviewed. Also St. Joseph R/C JHS, Pankrono was chosen for the Urban JHS, and 60 students were interviewed whiles Kwanwoma D/A JHS was chosen for the Rural JHS, and 40 students were interviewed there. In each school, the number of students required are divided roughly into three to get the opinions of all the three levels (forms) in the school.

180 copies of the questionnaire were printed into hardcopy since JHS/SHS are prohibited from using devices in school. The students are isolated with an interviewer who reads the question to them and guide them on how to answer the questions especially with the JHS students. Their responses were recorded on the sheets. Their responses were then entered into Microsoft Excel, but the sheets are kept for evidence purposes.

C. Questionnaire design

The questionnaire was designed to seek the answers to the following questions (not all questions are listed, the most relevant ones are):

[1]Whether respondent has at least a slight knowledge about Dementia or its related diseases

2. Whether respondent believe in superstitions

3.Whether respondent knows someone who may be suffering from Dementia-related diseases

and what the respondent think may be source of disease

4.In the case respondent knows no one like that, he/she is still asked what he/she will think as

the source of a friend's disease if presented with Dementia-related symptoms.

D. Data Analysis

The responses on the Microsoft Excel were coded and extracted into the STATA Statistical software. All statistical calculations were made, and the multiple linear regression model was run in the software. The software analyzed the data and gave results in the form of tables.

E. Validity and Ethical Protection of Respondents

To ensure accuracy and validity, all data entered were cross-checked multiple times and all values and results obtained were entered correctly. Again, the evidence of the responses (hardcopies) is available, and the schools are open to verify them. However, the respondents are to remain anonymous i.e., they can confirm to be participants, but unique responses cannot be traced to their respective respondents.

III. RESULTS

A. Superstition Results

Out of 180 students, 133 (73.89%) were superstitious and 47 (26.11%) were not (**Table I**). In **Table III,** it was observed that 60.90% of the superstitious students thought that the diseases were of non-medical origin (supernatural, imposed by witches or patient may be witch him/herself). It can also be

observed that only 34.04% of the non-superstitious students thought about non-medical reasons.

B. Ignorance Results

The research names ignorance but in the questionnaire design, questions were framed to seek how exposed the students were to the Dementia-related disease which is the inverse of ignorance. Out of the 180 students, 151 (83.89%) had no idea of what Dementia was about and only 29 (16.11%) had an idea which was not concrete (**Table 11**). Some had just heard it before and when the 29 were asked to explain what they know about it only 17 gave a closer answer. **Table IV**shows that 57.62% of non-exposed students thought that the disease was of non-medical origin while only 34.48% of exposed or knowledgeable students thought of non-medical origin.

C. Multiple Linear Regression Results

Statistically significant p values which prove evident of relationship between the students' reactions or thoughts on source of disease and the factors were recorded: 0.037 for exposure and 0.002 for superstition (**Table V**).

Table I: Superstition results

Believe in witchcrafts,demons or ghost	Freq.	Percent	Cum.
Non-Superstitious	47	26.11	26.11
Superstitious	133	73.89	100.00
Total	180	100.00	

Table II: Students with at least exposure to Dementia

Have at least slight knowledge about dementia	Freq.	Percent	Cum.
No	151	83.89	83.89
Yes	29	16.11	100.00
Total	180	100.00	

Table III: Comparison of superstition and Students Thoughts on source of disease

Superstition	Person's thought on what might be source of disease		Total
	Not medic	Medically	
Non-Superstitious	16	31	47
Superstitious	81	52	133
Total	97	83	180

Table IV: Comparison of Exposure to Dementia concepts and Students Thoughts on source of disease

Have at least slight knowledge about dementia	Person's thought on what might be source of disease		Total
	Not medic	Medically	
No	87	64	151
Yes	10	19	29
Total	97	83	180

Table V: Multiple Linear Regression Results

thought	Coefficient	Std. err.	t	P>|t|	[95% conf. interval]	
Exposure	.2059638	.0981563	2.10	0.037	.0122565	.399671
superstition	-.2541983	.0821544	-3.09	0.002	-.4163265	-.0920702

IV. DISCUSSION

Two main topics will be discussed in this section: **the statistical results proving the relationship between the factors and the reactions** and **calculations and logic which consolidate why educating JHS/SHS alone is expected to increase the awareness of Dementia in the future massively.**

A. Results discussion

From **Table 3** and **Table 4**, it can even be deduced that these superstitions and exposure to Dementia have influence on the students' thoughts. The p values and coefficients obtained also consolidate those claims. Mathematically, after running multiple linear regression model on a set of data, one can only be sure of evidence of relationship when p values are less than 0.05 in order to discard the null hypothesis. The values we obtained however were less than the 0.05 with that of Ignorance almost insignificant compared to the 0.05 significance level. Therefore, it is proven mathematically that there are relationships between thought on sources of dementia and the factors (ignorance and superstition).

B. Calculations and discussion on how educating JHS/SHS will be effective in promoting awareness of Dementia in the future

The average ages of students in JHS and SHS are 13-16 and 16-19 respectively (Scholaro,2023). A study on Adolescence reported by Maricopa Community Colleges confirmed that the human brain is enhanced in its cognitive functions from the age of 12. This means JHS is the lowest education level in Ghana that sensitive topics like Dementia can be taught. Also, according to the reports of PHC on Literacy and Education,2021, only 12.1% of people who started school from the basic level pursue educational levels higher than SHS. Therefore, it is logical to teach JHS and SHS students about the disease rather than lower levels where the students cannot understand or higher levels which has only few students and have already passed through JHS/SHS.

There were 28,614,764 people older than 3 years in Ghana during the reports of Population and Housing Census in Ghana,2021. Below is the relevant information to this research extracted from the PHC's Report on Literacy and Education,2021.

- Number of people older than 3 years that never went to school➔5,952,272 (20.80%)
- Number of people older than 3 years that has finished JHS➔10,826,162 (37,83%)
- Number of people older than 3 years that are currently attending JHS/SHS➔3,519,195 (12.30%)
- Number of people older than 3 years currently attending levels lower than JHS➔6,732,753 (23.53%)
- Number of people older than 3 years currently attending levels higher than SHS➔992,625 (3.469%)
- Number of people older than 3 years that schooled but never made it to JHS➔592,611 (2.071%)

Assumptions made in the following calculations:

1. The current year is 2021.
2. No change or growth in the population in the next 9 years (deaths of the older population will be replaced by the births of younger population) to keep the percentages consistent.

➢ If we start teaching JHS and SHS students on Dementia-related diseases, 3,519,195 people would have been made aware of the disorders and that correspond to 11.41% of the total population (Total population reported is 30,832,019 by PHC,2021).

➢ Considering the number of people that never made it to JHS, it can be deduced that 6,140,142 people of the total 6,732,753 people who are currently attending levels below JHS will make it to JHS. That will also be 19.91% of the whole population that would have received this awareness.

➢ This makes a total of 9,656,588 31.32% of the population aware of the disease in the next 9 years.

➢ However, from the PHC Reports on Fertility and Mortality, 2021, the number of people between the ages of 10 and 19 that died that year is 4,699 and so it was again assumed that in the next 9 years 42,291 of the JHS/SHS attenders and graduates will die.

➢ This leaves 9,614,297 JHS/SHS attenders and graduates. From the assumptions, number of deaths equal deaths and the population is quite steady at 30,832,019. This gives the net population that is made aware to be 31.18%.

➢ If after 9 years, the Ghanaian population continues to educate the JHS/SHS and make all the above assumptions again, then in the next 9 years after the

first term of 9 years, another 31.18% of the population will be made aware. However, that will not make the total made aware be 62.36% of the total population due to factors like the already educated population dying which was not considered in the assumptions. So, the closer accurate percentage expected may be 60.00% or less. With this, in the next three terms of 9 years, roughly all the population would have been made aware.

V. CONCLUSION

Superstition and ignorance are the factors which influence students' reaction towards Dementia and educating JHS/SHS students is the effective way to promote the awareness of Dementia in the future. The findings and these suggestions are applicable not to only Ghana but to every country. This paper can serve as the foundation for many countries and policy makers as well as dementia awareness advocates to understand where they must channel their resources to promote awareness. It also gives the general overview of how little people, especially in the continent of Africa, know about the disease and will educate any reader.

ACKNOLEDGMENT

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