

# Awareness of varicella-zoster virus among undergraduate students at the University of Namibia

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## Abstract

Although varicella-zoster virus (VZV) is preventable and curable, the disease remains a public health problem in Namibia. Access to vaccination in the country remains a challenge for many citizens including students. No previous study has been conducted to assess awareness on the prevention and control of VZV in Namibia. The overall purpose of the study was to investigate the awareness of hostel students on prevention and control measures for VZV in Namibia. The objective of the study was to assess and describe the awareness of hostel students on the prevention and control measures for VZV in Namibia. A quantitative descriptive study using an online questionnaire was used. Simple random sampling was used to select 165 respondents. Descriptive statistics and a non-parametric Kruskal Wallis test were performed to test the mean differences between variables and the significance of the data. A great proportion of the respondents, 70.7% (n=118), were aware that VZV is caused by a virus (0.71±0.45) while 76% (n=127) (0.76±0.42) were aware that VZV can be vaccinated against. The study found a strong association between aetiology (p=0.03), available information (p=0.00), mode of transmission (p=0.02), and knowledge on contagious diseases (p=0.03). The results were inconclusive as to whether the level of awareness is high or low, owing to the differences in scores for each variable. The study recommends that a mobile clinic be established on campus to offer health education information.

## Introduction

The varicella-zoster virus (VZV) causes chickenpox, which is an acute and highly contagious disease that results in blister-like rashes, itching, fatigue and fever.<sup>1</sup> Varicella occurs worldwide and, in the absence of a vaccination programme, affects nearly every person by mid-adulthood. Prior to the

introduction of a vaccine, VZV afflicted about 4 million people a year, led to more than 10 500 hospitalisations, and about 100 to 150 deaths.<sup>2</sup> Although the death rate is relatively low (1 in 60.000 cases) it may lead to serious complications, namely, viral and bacterial pneumonia, meningitis, encephalitis, seizures, skin infections and coma.<sup>3</sup> The epidemiology of the disease differs between temperate and tropical climates but is common in developing countries where poor sanitation and vaccination are challenges.<sup>4</sup>

In developing countries generally, the status of varicella infection and vaccination is unclear. Some Middle East countries have reported on varicella burden, seroprevalence, complications and the high cost of medical care and hospitalisation. To develop a vaccination protocol and appropriate preventive health care measures against diseases in different countries, it is very important to know the seroprevalence of any disease for an individual country.<sup>5</sup>

The African continent has several risk factors that could result in an increased burden of VZV disease; these include the high prevalence of HIV/AIDS, primary infections among the elderly mainly found in tropical countries, and diabetes prevalence. These factors may overstretch the already challenged healthcare systems in Africa, preventing the management of the complications of many diseases, including VZV. Furthermore, VZV causes varicella and herpes zoster. Most available data on VZV epidemiology are from temperate, industrialised countries and cannot be used to guide decisions on an immunisation policy against VZV in Africa, given Africa's limited resources and healthcare system challenges.<sup>6</sup> Every decade since the 1940s, health policymakers, professionals and providers have launched new global and national initiatives in an attempt to address the health challenges and needs of populations, particularly those living in sub-Saharan Africa. However, only a few reforms have been successful.<sup>4</sup>

A systematic review of twenty articles from 13 African countries revealed that VZV seroprevalence is high among adults and co-morbidity with VZV is common. Furthermore, there is a lack of quality data to develop VZV control programmes, including vaccination, in Africa.<sup>6</sup> In comparison to developed countries where vaccination is available, in developing countries such as Namibia, VZV vaccination is not provided at public health facilities, while the private sector charges exorbitant fees, thus excluding 85% of the population who depend on public health services. Hence, many VZV victims present with severe con-

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Informed consent: The researcher explained the study objectives and purpose to the respondents and that participation in the study was voluntary. Willing respondents signed the informed consent but still were free to withdraw from the study at any time without any penalties or loss of privileges.

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ditions, resulting in serious complications or death.<sup>2</sup> Although VZV is preventable and curable, the disease still remains a public health problem in Namibia, and access to vaccination remains a challenge for many citizens, including students. Apart from similar studies that have been conducted in other settings, no previous study has been conducted to assess the prevention and control of VZV in students' dormitories in Namibia. The researchers who were affiliated to the University of Namibia (UNAM), Rundu Campus, and observed nine cases of VZV in 2018, with those students being allowed to freely come into contact with other students and some even attending classes during their illness. This study aims to determine the awareness of hostel students on the prevention of and control measures for VZV at UNAM.

The goal of the study was to investigate the awareness of hostel students on the prevention of and control measures for VZV at UNAM. Its objectives were to assess and describe the awareness of hostel students on the prevention of and control measures for VZV at UNAM Rundu Campus.

## Materials and Methods

In this study, the researchers used a quantitative research design, with each step being standardised to reduce bias when collecting and analysing the data. The results for this approach are more valid, reliable and generalisable to a larger population.<sup>7</sup> The researcher conducted the study with students who board at a satellite campus of UNAM in the Eastern part of the country. In

2020, the campus had a total of 280 boarding students from three faculties: the Faculty of Health Sciences, Faculty of Education and Faculty of Economic and Management Sciences. The researcher chose this campus because it is a fast-growing campus with an undergraduate student population of 4000.

The study population comprised of 280 boarding students from the three faculties. The eligibility criteria for the study included boarding students who could communicate well in English, were willing and who gave consent to participate in the study.

Solvin's formula for estimating sample size

$$\frac{N}{(1+N \times a^2)}$$

was used to estimate the population sample with "N" being the total population and "a" being the total confidence limit at 95%, representing a margin of error of 0.05. A total of 165 boarding students were accordingly selected for this study.

Respondents were randomly selected from a population of 280 boarding students. This sampling technique ensures that all available people or objects for a study have an equal chance of being part of the study.<sup>8</sup> The inclusion criteria included all boarding undergraduate students who were 18 years

**Table 1. Demographic characteristics of the respondents (n=165).**

|                       | Frequency | Percent (%) |
|-----------------------|-----------|-------------|
| Gender                |           |             |
| Female                | 93        | 56.0        |
| Male                  | 72        | 44.0        |
| Total                 | 165       | 100.0       |
| Age                   |           |             |
| 18–25 Years           | 145       | 88.0        |
| 26–35 Years           | 20        | 12.0        |
| Total                 | 165       | 100.0       |
| Course of study       |           |             |
| 1 <sup>st</sup> year  | 11        | 6.6         |
| 2 <sup>nd</sup> year  | 37        | 22.4        |
| 3 <sup>rd</sup> year  | 46        | 27.8        |
| 4 <sup>th</sup> year  | 71        | 43.0        |
| Total                 | 165       | 100.0       |
| Bachelor of Economics | 12        | 7.2         |
| Bachelor of Education | 97        | 58.7        |
| Bachelor of Nursing   | 56        | 33.9        |
| Total                 | 165       | 100.0       |

**Table 2. Respondents' awareness of VZV.**

| Variables                          | Options           | Frequency | Percentage (%) | Mean (SD)   |
|------------------------------------|-------------------|-----------|----------------|-------------|
| Aetiology                          | Bacteria          | 49        | 29.3           | 0.71 (0.45) |
|                                    | Virus             | 118       | 70.7           |             |
| Information is available on campus | No                | 50        | 29.9           | 0.70 (0.45) |
|                                    | Yes               | 117       | 70.1           |             |
| Transmission                       | Sex               | 38        | 22.8           | 0.77 (0.42) |
|                                    | Contact           | 129       | 77.2           |             |
| VZV can be vaccinated against      | No                | 40        | 24.0           | 0.76 (0.42) |
|                                    | Yes               | 127       | 76.0           |             |
| Chicken pox increases absenteeism  | Strongly disagree | 6         | 3.6            | 4.23 (0.93) |
|                                    | Disagree          | 3         | 1.8            |             |
|                                    | Neutral           | 13        | 7.8            |             |
|                                    | Agree             | 70        | 41.9           |             |
|                                    | Strongly agree    | 75        | 44.9           |             |
| Chicken pox is contagious          | Strongly disagree | 2         | 1.2            | 4.16 (0.87) |
|                                    | Disagree          | 6         | 3.6            |             |
|                                    | Neutral           | 22        | 13.2           |             |
|                                    | Agree             | 71        | 42.5           |             |
|                                    | Strongly agree    | 66        | 39.5           |             |

and above, from the three faculties on the campus.

In this study, data was collected from 165 respondents using an online questionnaire. This data collection tool was used for the study, as it is considered relevant for use when the researcher seeks to collect data from a larger sample.<sup>8</sup> Furthermore, an online questionnaire was considered suitable for collecting data during the Covid-19 pandemic, in line with social distance guidelines. The researcher developed the questionnaire in English as all the respondents were conversant with the English language. The researcher approached the respondents via the boarding students' WhatsApp group, giving a link to the online questionnaire. Subsequently, a total of 165 respondents completed the online questionnaire.

Data was analysed with SPSS version 26.0. Descriptive statistics and inferential statistics (frequency, mean, standard deviation and percentage) and a non-parametric Kruskal Wallis test were performed to test the mean differences between variables for the significance of unequally distributed data. The acceptable level of significance was  $p=0.05$ .

## Results

A total of 165 online questionnaires were distributed among hostel students via the institution's WhatsApp groups. The study attracted a 100% ( $n=165$ ) response rate.

Table 1 outlines the characteristics of the respondents. Accordingly, this study reveals that more females, 56% ( $n=93$ ), than males, 44% ( $n=72$ ), took part in the study. The majority of the respondents were in their fourth year, 43% ( $n=71$ ) and between the age of 18 and 25 years, 88% ( $n=145$ ). Most respondents, 58.7% ( $n=97$ ), were enrolled for the Bachelor of Education.

The majority of respondents, 70.7% ( $n=118$ ), were aware that VZV is caused by a virus, 29.3% ( $n=49$ ) ( $0.71\pm0.45$ ) believed that VZV is caused by a bacteria, while 22.8% ( $n=38$ ) ( $0.77\pm0.42$ ) believed VZV is sexually transmitted. Regarding vaccination, 76% ( $n=127$ ) ( $0.76\pm0.42$ ) indicated that VZV can be vaccinated against, whereas 42.5% ( $n=71$ ) ( $4.16\pm0.87$ ) agreed that chicken pox is contagious (Table 2).

Table 3 highlights respondents' aware-

ness of VZV among the different courses of study. The study found no statistical significance between VZV-related absenteeism ( $p=0.89$ ) and the course of study. The study did, however, find a strong association between aetiology ( $p=0.003$ ), available information ( $p=0.00$ ), mode of transmission ( $p=0.02$ ), knowledge on contagious diseases ( $p=0.03$ ) and course of study.

## Discussion

The majority of respondents, 70.7% ( $n=118$ ), knew that VZV is a viral disease; this was supported by a great proportion, 70.1% ( $n=117$ ), who were in agreement that information on VZV exists on campus. These findings are supported by a survey carried out among biology students which revealed that about 98% of the students believed VZV to be a viral disease.<sup>9,10</sup>

Awareness on how VZV is transmitted is important in the prevention and control of VZV spread. The study found 77.2% ( $n=129$ ) to have the awareness that VZV is spread through close contact but is not a sexually transmitted disease. These findings correspond to Shiel's,<sup>1</sup> whose study

**Table 3. Respondents' awareness of VZV among different courses of studies.**

|                                    |                       | Course of study |         |          | P*    |
|------------------------------------|-----------------------|-----------------|---------|----------|-------|
|                                    |                       | Education       | Nursing | Economic |       |
| Aetiology                          | Bacteria              | 39              | 9       | 1        | 0.003 |
|                                    | Virus                 | 59              | 47      | 10       |       |
|                                    | Total                 | 56              | 11      | 165      |       |
| Information is available on campus | No                    | 40              | 9       | 1        | 0.002 |
|                                    | Yes                   | 58              | 47      | 10       |       |
|                                    | Total                 | 56              | 11      | 165      |       |
| Transmission                       | Sex                   | 28              | 6       | 4        | 0.023 |
|                                    | Contact               | 70              | 50      | 7        |       |
|                                    | Total                 | 56              | 11      | 165      |       |
| Need for vaccination               | No                    | 11              | 26      | 2        | 0.000 |
|                                    | Yes                   | 87              | 30      | 9        |       |
|                                    | Total                 | 56              | 11      | 165      |       |
| VZV increases absenteeism          | Strongly disagree     | 4               | 1       | 1        | 0.896 |
|                                    | Disagree              | 2               | 1       | 0        |       |
|                                    | Neutral               | 8               | 4       | 1        |       |
|                                    | Agree                 | 41              | 25      | 3        |       |
|                                    | Strongly agree        | 43              | 25      | 6        |       |
|                                    | Total                 | 56              | 11      | 165      |       |
| VZV is contagious                  | Strongly disagree     | 1               | 1       | 0        | 0.031 |
|                                    | Disagree              | 6               | 0       | 0        |       |
|                                    | Neutral               | 15              | 6       | 1        |       |
|                                    | Agree                 | 45              | 20      | 5        |       |
|                                    | Strongly agree        | 31              | 29      | 5        |       |
|                                    | Total                 | 56              | 11      | 165      |       |
| The most affected organ is?        | Respiratory system    | 7               | 10      | 1        | 0.050 |
|                                    | Integumentary system  | 26              | 18      | 2        |       |
|                                    | Reproductive system   | 22              | 14      | 4        |       |
|                                    | Cardiovascular system | 30              | 8       | 3        |       |
|                                    | Digestive system      | 13              | 6       | 1        |       |
|                                    | Total                 | 56              | 11      | 165      |       |

\*Kruskal Wallis Test

reaffirmed that VZV spreads from one person to another by means of direct contact and through the air.

Regarding vaccination, 76% (n=127) of respondents agreed that vaccination is generally warranted to prevent VZV. These findings are in line with those of Leung *et al.*<sup>11</sup> that vaccination should be offered to all susceptible individuals to prevent hospital outbreaks, as well as academic and economic loss for students. A study conducted in Sri Lanka on the susceptibility of new entrant university students to VZV revealed that of the 458 eligible students those who were unvaccinated had low levels of immunoglobulin G (IgG) antibodies compared to those who were vaccinated.<sup>12</sup>

A significant number of respondents, 44.9% (n=75), felt that contracting VZV led to the disruption of classes and increased absenteeism. This concurs with a similar study by Kurukulasooriya *et al.*<sup>13</sup> which found that VZV outbreaks can lead to the disruption of school attendance and activities; students with varicella may miss classes and activities for seven days or more.

## Conclusions

Based on the study results it was evident that students had an awareness of VZV. Although it may be concluded that the findings were statistically significant with regard to the course of study ( $p < 0.05$ ), no statistical significance was found between absenteeism, course of study and awareness of VZV. Greater efforts to disseminate information about VZV disease, its preven-

tion and control need to be implemented at UNAM Rundu campus. Existing health programs on school health can be particular vital in creating awareness among university boarding students.

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