
“PREVALENCE AND REACTIVATION FEATURES OF HERPES SIMPLEX VIRUS TYPE 1 AND VARICELLA-ZOSTER VIRUS CASES ADMITTED IN QUATERNARY CARE HOSPITAL, BELAGAVI”

Manjunath Jadhav*¹, Tejesh Patil²

¹Department of Child Health Nursing, Arihant Institute of Nursing Sciences Belagavi, India.

²Department of Child Health Nursing, K.L.E Society's Centenary Institute of Nursing Sciences, Yallur Road Belagavi, India.

Article Received: 13 May 2026

Article Revised: 03 June 2026

Published on: 23 June 2026

***Corresponding Author: Manjunath Jadhav**

Department of Child Health Nursing, Arihant Institute of Nursing Sciences
Belagavi, India.

DOI: <https://doi-doi.org/101555/ijrpa.4947>

ABSTARCT

BACKGROUND

Herpes simplex virus type 1 and varicella-zoster virus (VZV; human herpesvirus are human neurotropic alphaherpesviruses that cause lifelong infections in ganglia. So the investigation conducted on “Prevalence and reactivation features of herpes simplex virus type 1 and varicella-zoster virus cases admitted in quaternary care hospital, Belagavi”.

MATERIAL AND METHODS: A clinical based observational study conducted on “Prevalence and reactivation features of herpes simplex virus type 1 and varicella-zoster virus cases admitted in quaternary care hospital, Belagavi”. The researcher adopted descriptive research approach by following quantitative method. Data collection was done by purposive sampling technique, the number of research subjects are 120. Tabulation and analysis was done by descriptive and inferential statistics.

RESULTS: Findings revealed that strong positive linear relationship between prevalence and reactivation features of herpes simplex virus type 1 and varicella-zoster virus cases. P value is 0.05 levels of significance, hence alternate hypothesis accepted and null hypothesis was rejected, and the table value is 1.764.

CONCLUSION: At the conclusion of the study, a significant association was found between prevalence and reactivation features of herpes simplex virus type 1 and varicella-zoster virus cases with demographic variables.

KEYWORDS: Prevalence. Reactivation features, herpes simplex virus type 1, & varicella zoster, quaternary hospital.

INTRODUCTION

Herpes simplex virus type 1 (HSV-1; human herpes virus 1) and varicella-zoster virus (VZV; human herpes virus 3) are human neurotropic alphaherpesviruses usually acquired early in life. Primary HSV-1 infection is usually localized and may be asymptomatic, although it can produce a more widespread systemic infection in neonates and immunocompromised adults, whilst primary VZV infection is systemic and results in childhood varicella (chickenpox). During primary infection, both viruses gain access to neurons most likely through retrograde transport from the site of cutaneous lesion.¹

Herpes zoster is commonly known as shingles. It is a viral disease caused by reactivation of varicella-zoster virus which remains dormant in the sensory ganglia of the cranial nerve or the dorsal root ganglia after a previous varicella infection. Varicella is commonly known as chickenpox; it occurs in children while herpes zoster occurs in adults or the elderly. It is believed that zoster occurs due to the failure of the immune defence system to control the latent replication of the virus. The incidence of herpes zoster is strongly correlated to the immune status. Individuals who maintain a high level of immunity rarely develop shingles. The infection is not benign and can present in many ways. Even after herpes zoster resolves, many patients continue to suffer from moderate to severe pain known as postherpetic neuralgia.²

Herpes viruses infect the majority of the world's human population. An estimated 67% of the population under the age of 50 is infected with herpes simplex virus type 1 (HSV-1). The virus contracts through the mucus membranes during childhood and remains latent in the ophthalmic division of the trigeminal ganglion. Its reactivation causes recurrent infections. Approximately 99% of people over the age of 40 in Germany have faced a varicella-zoster virus (VZV) (human herpes virus 3) infection, and about 20–30% of people develop symptomatic VZV infection during their lives. It occurs primarily in the elderly and/or immunocompromised people. The lifetime prevalence is 25–50%.³

Neurotrophism and latent infection are common characteristics of herpes virus. Concurrent reactivation of herpes simplex virus (HSV) and varicella zoster virus (VZV), however, is rare, and this may be due to their different biologic features such as recurrence rate, age of reactivation, reactivating cause, resident site in latency, etc. Until now, the simultaneous reactivation of the two herpes viruses has mainly been reported in immunocompromised

patients, probably because immunosuppressed patients are predisposed to infection and because the clinical features in immunosuppressed patients are more severe and extensive.⁴

Herpes simplex viruses (HSV-1, HSV-2) and varicella zoster virus (VZV) are related human alphaherpesviruses that cause common, self-resolving diseases of the skin or mucosa, and concurrently establish a persistent latent infection of neuronal nuclei in the sensory ganglia innervating the peripheral site of infection. All three viruses may subsequently reactivate to cause recurrent disease in the face of existing immunity. At the molecular level, the three viruses share most genes and encode similar functions. Given these observations, it is perhaps surprising that HSV and VZV adopt very different modes of pathogenesis in the human host.⁵

OBJECTIVES

- To determine the prevalence of herpes simplex virus type 1 and varicella-zoster virus cases with demographic variables.
- To determine the reactivation feature of herpes simplex virus type 1 and varicella-zoster virus cases with demographic variables.
- To evaluate the correlation between prevalence and reactivation feature of herpes simplex virus type 1 and varicella-zoster virus cases with demographic variables

HYPOTHESIS

H₁: There will be a significant association between prevalence of herpes simplex virus type 1 and varicella-zoster virus cases with demographic variables.

H₂: There will be a significant association between reactivation feature of herpes simplex virus type 1 and varicella-zoster virus cases with demographic variables.

H₃: There will be a strong positive linear relationship between prevalence and reactivation features of herpes simplex virus type 1 and varicella-zoster virus cases with demographic variables.

OPERATIONAL DEFINITIONS

Prevalence: Prevalence is how common a disease or condition is in a population at a given time.

Reactivation features: Reactivation features are the symptoms or changes that occur when a dormant disease returns and becomes active again.

Herpes simplex virus type 1: HSV-1 is a virus that commonly causes oral herpes, leading to cold sores or fever blisters around the mouth and lips.

Varicella zoster: Is a virus that causes chickenpox during the initial infection and can later reactivate to cause shingles.

Quaternary hospital: A **quaternary hospital** is a highly specialized healthcare center that provides advanced and complex medical treatments and procedures that are not usually available in other hospitals.

NEED FOR THE STUDY

Herpes viruses are world-wide in distribution and their mode of transmission is favoured by crowded living conditions, poor hygiene, and low socio-economic status and conditions that are typical of Eritrea and other developing countries. The prevalence of infections with these viruses is however; little studied in Eritrea, and partly because of the protracted political upheaval and military conflict that besieged the country for about 3 decades and partly because herpes viruses are less recognised as important health problems. Hence, this serological study is a preliminary work on the exploration of the prevalence of infections with these viruses in our population.⁶

Alpha-herpes viruses, comprising herpes simplex viruses 1 and 2 (HSV-1, HSV-2) and Varicella Zoster virus (VZV), are double-stranded DNA viruses with marked neurotropism. They cause recurrent infections with low mortality, except in cases involving central nervous system (CNS) infection, where outcomes depend on the etiologic agent and host immune status.⁷

Cutaneous infections by herpes simplex virus (HSV) and varicella zoster virus (VZV), both of which belong to the alpha subfamily of herpes viruses, are relatively common. After the primary infection, both HSV and VZV remain latent in the ganglia and may reactivate. Herpes labialis and herpes zoster have been estimated to occur in approximately 20–40% and 10–20% of the population, respectively. Simultaneous occurrence of both HSV and VZV has rarely been reported.⁸

RESULTS

Table 1: Distribution of respondents in accordance to demographic variables.

N= 120

Variable	Prevalence		Reactivation		Chi-square
	Frequency	Percentage	Frequency	Percentage	
Age					
20-25 years	10	16.6	12	20	X ² = 2.23 DF= 9 P value= 0.9*
26-30 years	13	21.6	10	16.6	
31-35 years	17	28.3	21	35	

>35 years	20	33.3	17	28.3	
Total	60	100%	60	100%	
Gender					
Male	20	33.3	18	30	$X^2= 3.61$ $DF= 1$ P value= 0.5*
Female	40	66.3	42	70	
Total	60	100%	60	100%	
Religion					
Hindu	25	41.6	24	40	$X^2= 2.82$ $DF= 9$ P value= 0.9*
Muslim	14	23.3	13	21.6	
Christian	13	21.6	14	23.3	
Others	8	13.3	9	15	
Total	60	100%	60	100%	
Marital Status					
Single	12	20	11	18.3	$X^2= 3.14$ $DF= 4$ P value= 0.7*
Married	38	63.3	37	61.6	
Widow	10	16.6	12	20	
Total	60	100%	60	100%	

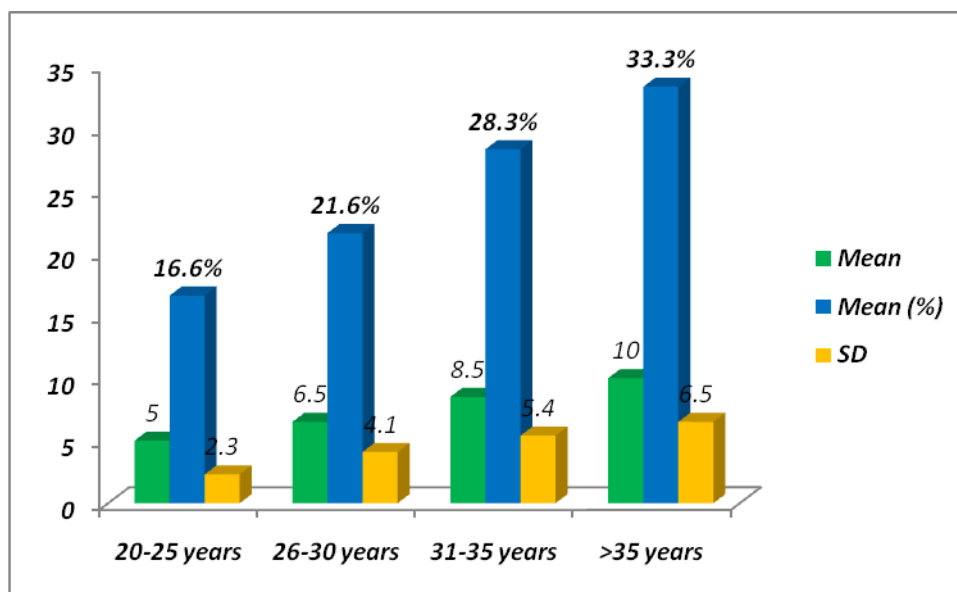
*P Value > 0.05 level of significance.

Table 2: Distribution of respondent's according to prevalence of herpes simplex virus type 1 and varicella-zoster virus cases with their mean, mean percentage, and SD.

N=60

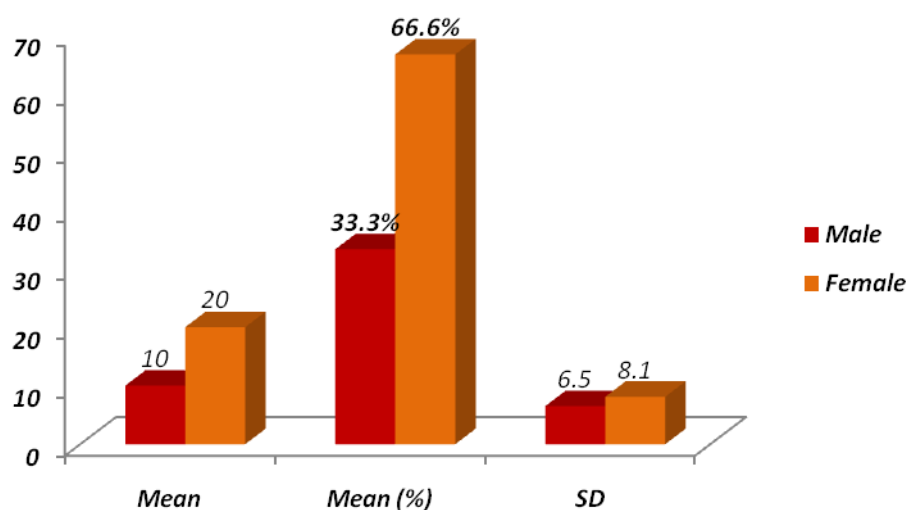
Variable	Prevalence		Mean	Mean (%)	SD
	Frequency	Percentage			
Age					
20-25 years	10	16.6	5	16.6	2.3
26-30 years	13	21.6	6.5	21.6	4.1
31-35 years	17	28.3	8.5	28.3	5.4
>35 years	20	33.3	10	33.3	6.5
Total	60	100%	30	100%	
Gender					
Male	20	33.3	10	33.3	6.5
Female	40	66.3	20	66.6	8.1
Total	60	100%	30	100%	
Religion					
Hindu	25	41.6	12.5	41.6	7.1
Muslim	14	23.3	7	23.3	5.1
Christian	13	21.6	6.5	21.6	4.2
Others	8	13.3	4	13.3	1.3
Total	60	100%	30	100%	
Marital Status					
Single	12	20	6	20	3.8
Married	38	63.3	19	63.3	5.8
Widow	10	16.6	5	16.6	2.2
Total	60	100%	30	100%	

*P Value 0.05 level of significance.



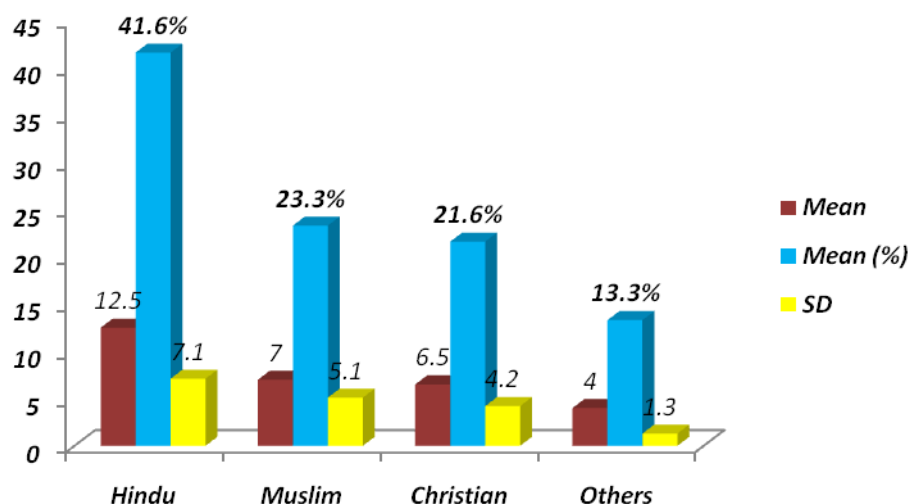
Graph 1: Age distribution.

Graph 1, revealed that majority of the findings belonged to > 35 years of their mean is 10, mean percentage 33.3%, and SD + 6.5. More or less similar findings belonged to 31-35 years of their mean is 8.5, mean percentage 28.3% and SD + 5.4. More or less similar findings belonged 26-30 years of their mean is 6.5, mean percentage 21.6%, and SD + 4.1. Less similar findings belonged to 20-25 years of their mean is 5, mean percentage 16.6%, and SD + 2.3.



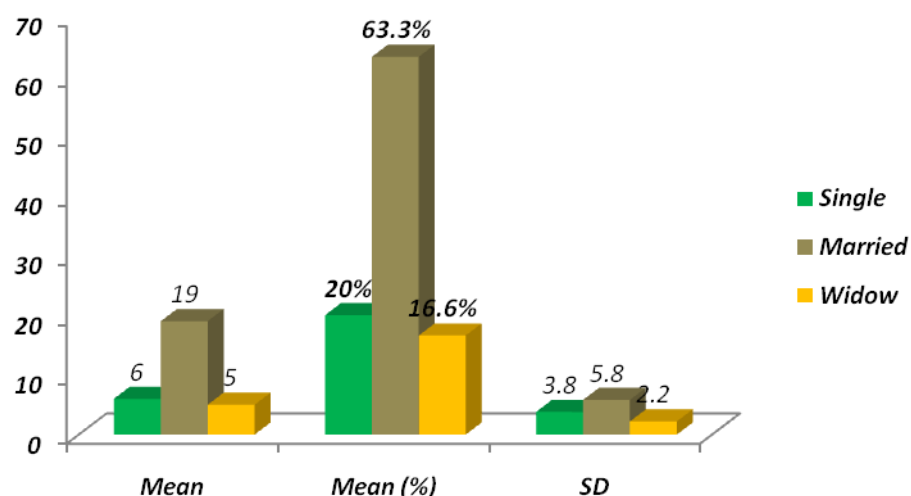
Graph 2: Gender distribution.

Graph 2, revealed that majority of the findings belonged to females of their mean is 20, mean percentage 66.6%, and SD + 8.1. Less similar findings belonged to males of their mean is 10, mean percentage 33.3%, and SD + 6.5.



Graph 3: Religion distribution.

Graph 3, revealed that majority of the findings belonged to Hindus of their mean is 12.5, mean percentage 41.6%, and SD + 7.1. More or less similar findings belonged to Muslims of their mean is 7, mean percentage is 23.3%, and SD + 5.1. More or less similar findings belonged to Christians of their mean is 6.5, mean percentage 21.6%, and SD + 4.2. Less similar findings belonged to others of their mean is 4, mean percentage 13.3%, and SD + 1.3.



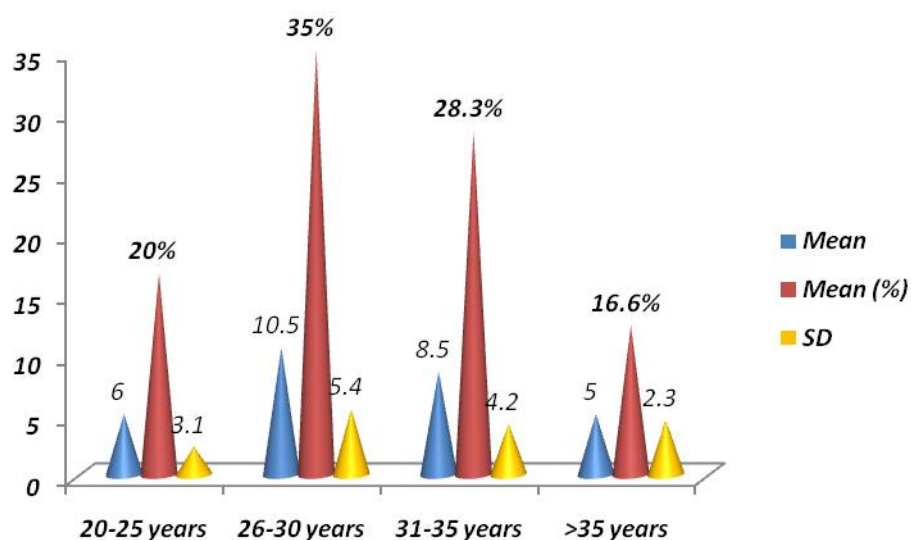
Graph 4: Marital status distribution.

Graph 4, revealed that majority of the findings belonged to married of their mean is 19, mean percentage 63.3%, SD + 5.8. More or less similar findings belonged to single of their mean is 6, mean percentage 20%, and SD + 3.8. Less similar findings belonged to widows of their mean is 5, mean percentage 16.6%, and SD + 2.2.

Table 3: Distribution of respondent's according to reactivation features of herpes simplex virus type 1 and varicella-zoster virus cases with their mean, mean percentage, and SD. N=60

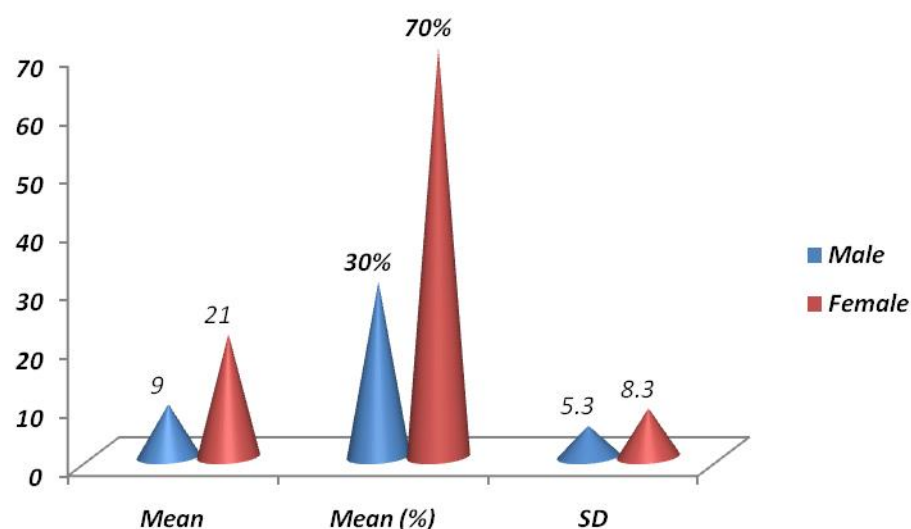
Variable	Reactivation		Mean	Mean (%)	SD
	Frequency	Percentage			
Age					
20-25 years	12	20	6	20	3.1
26-30 years	10	16.6	5	16.6	2.3
31-35 years	21	35	10.5	35	5.4
>35 years	17	28.3	8.5	28.3	4.2
Total	60	100%	30	100%	
Gender					
Male	18	30	9	30	5.3
Female	42	70	21	70	8.3
Total	60	100%	30	100%	
Religion					
Hindu	24	40	12	40	6.8
Muslim	13	21.6	6.5	21.6	3.8
Christian	14	23.3	7	23.3	4.2
Others	9	15	3.5	11.6	1.8
Total	60	100%	30	100%	
Marital Status					
Single	11	18.3	5.5	18.3	2.9
Married	37	61.6	18.5	61.6	7.2
Widow	12	20	6	20	3.1
Total	60	100%	30	100%	

*P Value 0.05 level of significance.



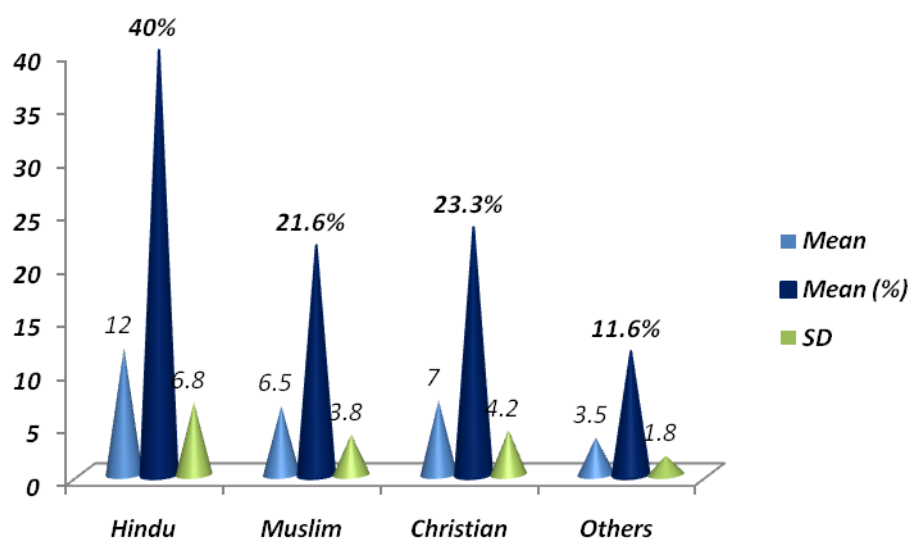
Graph 5: Age distribution.

Graph 5, revealed that majority of the findings belonged to 26-30 years of their mean is 10.5, mean percentage 35%, and SD + 5.4. More or less similar findings belonged to 31-35 years of their mean is 8.5, mean percentage 28.3%, and SD + 4.2. More or less similar findings belonged to 20-25 years of their mean is 6, mean percentage 20%, and SD + 3.1. Less similar findings belonged to > 35 years of their mean is 5, mean percentage 16.6%, and SD+ 2.3.



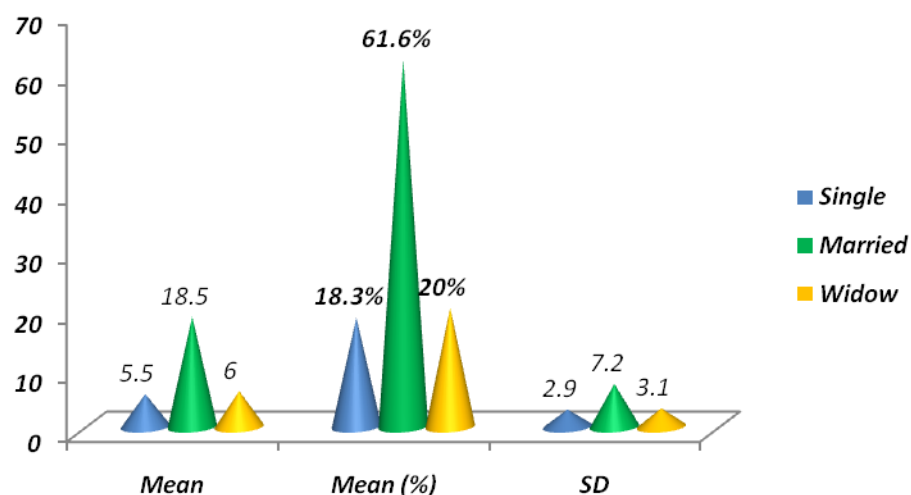
Graph 6: Gender distribution.

Graph 6, revealed that majority of the findings belonged to females of their mean is 21, mean percentage 70%, and SD + 8.3. Less similar findings belonged to males of their mean is 9, mean percentage 30% and SD + 5.3.



Graph 7: Religion distribution.

Graph 7, revealed that majority of the findings belonged to Hindus of their mean is 12, mean percentage 40%, and SD + 6.8. More or less similar findings belonged to Christians of their mean is 7, mean percentage 23.3%, and SD + 4.2. More or less similar findings belonged to Muslims of their mean is 6.5, mean percentage 21.6%, and SD + 3.8. Less similar findings belonged to others of their mean is 3.5, mean percentage 11.6%, and SD + 1.8.



Graph 8: Marital status distribution.

Graph 8, revealed that majority of the findings belonged to married of their mean is 18.5, mean percentage 61.6%, and SD + 7.2. More or less similar findings belonged to widows of

their mean is 6, mean percentage 20%, and SD + 3.1. Less similar findings belonged to single of their mean is 5.5, mean percentage 18.3%, and SD + 2.9.

Table 4: Correlation between Prevalence and reactivation features of herpes simplex virus type 1 and varicella-zoster virus cases. N=120

Age	Prevalence	Reactivation	Correlation
20-25 years	10	12	r = 0.7
26-30 years	13	10	P Value= 0.05*
31-35 years	17	21	T value= 1.764
>35 years	20	17	
Gender			
Male	20	18	
Female	40	42	
Religion			
Hindu	25	24	
Muslim	14	13	
Christian	13	14	
Others	8	9	
Marital Status			
Single	12	11	
Married	38	37	
Widow	10	12	

Table 4, revealed that a strong positive linear relationship between prevalence and reactivation features of herpes simplex virus type 1 and varicella-zoster virus cases. P value is 0.05 levels of significance, hence alternate hypothesis accepted and null hypothesis was rejected, and the table value is 1.764.

DISCUSSION

In the present study revealed that findings related to prevalence of herpes simplex virus type 1 and varicella zoster.

Age distribution: Graph 1, revealed that majority of the findings belonged to > 35 years of their mean is 10, mean percentage 33.3%, and SD + 6.5. More or less similar findings belonged to 31-35 years of their mean is 8.5, mean percentage 28.3% and SD + 5.4. More or less similar findings belonged 26-30 years of their mean is 6.5, mean percentage 21.6%, and SD + 4.1. Less similar findings belonged to 20-25 years of their mean is 5, mean percentage 16.6%, and SD + 2.3.

Gender distribution: Graph 2, revealed that majority of the findings belonged to females of their mean is 20, mean percentage 66.6%, and SD + 8.1. Less similar findings belonged to males of their mean is 10, mean percentage 33.3%, and SD + 6.5.

Religion distribution: Graph 3, revealed that majority of the findings belonged to Hindus of their mean is 12.5, mean percentage 41.6%, and SD + 7.1. More or less similar findings belonged to Muslims of their mean is 7, mean percentage is 23.3%, and SD + 5.1. More or less similar findings belonged to Christians of their mean is 6.5, mean percentage 21.6%, and SD + 4.2. Less similar findings belonged to others of their mean is 4, mean percentage 13.3%, and SD + 1.3.

Marital status distribution: Graph 4, revealed that majority of the findings belonged to married of their mean is 19, mean percentage 63.3%, SD + 5.8. More or less similar findings belonged to single of their mean is 6, mean percentage 20%, and SD + 3.8. Less similar findings belonged to widows of their mean is 5, mean percentage 16.6%, and SD + 2.2.

In the present study revealed that findings related to reactivation features of herpes simplex virus type 1 and varicella zoster.

Age distribution: Graph 5, revealed that majority of the findings belonged to 26-30 years of their mean is 10.5, mean percentage 35%, and SD + 5.4. More or less similar findings belonged to 31-35 years of their mean is 8.5, mean percentage 28.3%, and SD + 4.2. More or less similar findings belonged to 20-25 years of their mean is 6, mean percentage 20%, and SD + 3.1. Less similar findings belonged to > 35 years of their mean is 5, mean percentage 16.6%, and SD+ 2.3.

Gender distribution: Graph 6, revealed that majority of the findings belonged to females of their mean is 21, mean percentage 70%, and SD + 8.3. Less similar findings belonged to males of their mean is 9, mean percentage 30% and SD + 5.3.

Religion distribution: Graph 7, revealed that majority of the findings belonged to Hindus of their mean is 12, mean percentage 40%, and SD + 6.8. More or less similar findings belonged to Christians of their mean is 7, mean percentage 23.3%, and SD + 4.2. More or less similar findings belonged to Muslims of their mean is 6.5, mean percentage 21.6%, and SD + 3.8. Less similar findings belonged to others of their mean is 3.5, mean percentage 11.6%, and SD + 1.8.

Marital status distribution: Graph 7, revealed that majority of the findings belonged to Hindus of their mean is 12, mean percentage 40%, and SD + 6.8. More or less similar findings belonged to Christians of their mean is 7, mean percentage 23.3%, and SD + 4.2. More or less similar findings belonged to Muslims of their mean is 6.5, mean percentage 21.6%, and SD + 3.8. Less similar findings belonged to others of their mean is 3.5, mean percentage 11.6%, and SD + 1.8.

In the similar study findings shows that.

The virus DNA burden in human neurons removed at autopsy is extremely low, requiring real-time PCR analysis for reliable quantification. When calculated per 105 ganglionic cells, the virus genome copy number for HSV-1 DNA in human trigeminal ganglia is 2902+1082 (n515) (Pevenstein et al., 1999), 3043+2738 (n512) (Cohrs et al., 2000) and 2017+5778 (n512) for VZV, the virus genome copy number in human trigeminal ganglia is 258+38 (n515) (Pevenstein et al., 1999) and 9497+13 079 (n517) (Cohrs et al., 2000). These results underscore the variability encountered when examining autopsy tissue obtained from a random sample of the local population independent of age, sex, time of initial virus infection and number of re-exposures to the virus.

ETHICS STATEMENT: All procedures related to data protection and patient privacy were conducted in accordance with applicable regulations and institutional policies. Ethical Consideration I/we hereby declare that there are no ethical concerns associated with the study entitled “Prevalence and reactivation features of herpes simplex virus type 1 and varicella-zoster virus cases admitted in quaternary care hospital, Belagavi”. This study should not harm to any humans or animals, and informed consent was taken from all participants’ prior data collection. The name of the affiliated institution is ‘Arihant Institute of Nursing Sciences Belagavi. The ethical committee not found any of the issues in the study and granted us approval for further investigation.

Article Information and Declarations**Data availability statement**

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

Author’s Contributions

Manjunath Jadhav: Conceptualization, investigation, project administration, visualization, writing, original draft preparation, writing, review, editing, and statistics.

Tejesh Patil: Supervision, writing, review & editing.

Funding: No funding was received for this study.

REFERENCES

1. Kennedy PG, Rovnak J, Badani H, Cohrs RJ. A comparison of herpes simplex virus type 1 and varicella-zoster virus latency and reactivation. *Journal of General Virology*. 2015 July; 96(Pt_7):1581-602.

2. Nair PA, Patel BC. Herpes zoster. InStatPearls [Internet] 2023 Sep 4. StatPearls Publishing.
3. Horstmann ME, Al Hariri M, Grabitz SD, Bu JB, Apel M, Pfeiffer N, Wasielica-Poslednik J. Prevalence of herpes simplex and varicella-zoster virus DNA in corneal grafts is higher than expected. *Microorganisms*. 2023 Sep 26; 11(10):2405.
4. Park HH, Lee MH. Concurrent reactivation of varicella zoster virus and herpes simplex virus in an immunocompetent child. *Journal of Korean medical science*. 2004 Aug 31; 19(4):598.
5. Kinchington PR, Leger AJ, Guedon JM, Hendricks RL. Herpes simplex virus and varicella zoster virus, the house guests who never leave. *Herpes viridae*. 2012 June 12; 3(1):5.
6. Ghebrekidan H, Ruden U, Cox S, Wahren B, Grandien M. Prevalence of herpes simplex virus types 1 and 2, cytomegalovirus, and varicella-zoster virus infections in Eritrea. *Journal of clinical virology*.
7. Kakouris V, Kalyva N, Militopoulou M, Stamouli V, Meletis G, Kachrimanidou M, Paliogianni F. Epidemiology of Herpes Simplex and Varicella Zoster Virus-Associated Central Nervous System Infections in Western Greece: A Five-Year Retrospective Analysis. *Pathogens*. 2025 December 24; 15(1):30.
8. Kobayashi T, Yagami A, Suzuki K, Yoshikawa T, Matsunaga K. Concurrent reactivation of herpes simplex and varicella zoster viruses confirmed by the loop-mediated isothermal amplification assay. *Case reports in dermatology*. 2014 Apr 1; 6(1):5-9.