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Survey on Awareness of Rubella Vaccine among College Girls

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Authors' contributions

This work was carried out in collaboration between both authors. Author AV have aided in the conception of the topic, have participated in the study design, statistical analysis and in preparation of the manuscript. Author NPM has participated in the study design and have coordinated in developing the manuscript and made the final review. Both authors have discussed the study details between themselves and contribute to the final manuscript.

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ABSTRACT

Background: The Rubella virus is classified under the Arbovirus. It commonly affects children of age less than 10 years. In an adult, it mostly remains as a latent infection. Its persistence in an adult is more significant in a woman's life especially after adolescence, in the childbearing age. It is a factor commonly associated with infertility in a woman and congenital malformation. Latent infections in women will also lead to abortion. It is recommended by WHO that all women at childbearing age should be given a booster dose before the age of 18. In a country like India, rubella infection in women leads to social and mental issues. Thus the awareness among the girls at the age of 18 is imperative.
Methods: This survey was conducted among the 100 undergraduate students and postgraduate students at saveetha dental college from December, 2019 to January,2020. They were given a questionnaire to know about the rubella viral infection and the issues related to infertility. The results were collected and then analyzed through SPSS software. Descriptive statistical analysis was carried out and the chi-square test was used and the p-value was calculated.

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Results: The survey reveals that many girls are aware of the rubella vaccine but not its benefits in preventing rubella virus infection and its complications. Among them 50% girls have knowledge about the significance of rubella infection in young adults, 22% among them are aware of female infertility is also related to poor rubella immunity, 42% are aware of congenital malformation are common in rubella, 30% girls answered that rubella vaccine at our teenage will prevent infertility issues.

Conclusion: It is also found that the information they have on the consequence of the persistence of rubella in them is abstract. The real impact on their life is not understood by many. This is evident with their willingness to get immunized at the risky part of their life. This can be mitigated by conducting regular awareness camps in schools, colleges, and their workplace.

Keywords: Rubella virus; vaccine; infertility; congenital malformations.

1. INTRODUCTION

The rubella virus is classified under the arboviral infection. It commonly affects the children of less than the age of 10. In an adult it mostly remains as a latent infection [1]. It is important in a woman's life after adolescence, especially the childbearing age. It is a factor commonly associated with infertility in a woman [1,2]. The latent infection in women will also lead to abortion and congenital malformation. It is recommended by WHO that all women at childbearing age should be given a booster dose before the age of 18. In a country like India, rubella infection in a woman leads to a social and mental issue. so the awareness of the girls at the age of 18 [3]. The name "rubella" is from Latin and means little red. It was first described as a separate disease by German physicians in 1814 resulting in the name "German measles" [4,5].

Rubella vaccine was first licensed in 1969 [3,6]. It is on the World Health Organization's List of Essential Medicines, the foremost effective and safe vaccine required in an exceeding health system [3,6,7]. As of 2009 over a hundred thirty countries encompassed it in their routine vaccinations [8]. Immunization with live attenuated rubella virus vaccine has the demonstrated ability to prevent infection and one of the most feared complications – Congenital Rubella Syndrome(CRS) While much progress has occurred, rubella remains an important pathogen and public health concern around the world [9]. For example, the recent rubella epidemic in Japan, with more than 11,000 rubella cases occurring in the first 6 months of 2013 and at least 13 CRS cases occurring, highlights the fact that a partial vaccination strategy leads to major outbreaks [10]. Seventy percent of the rubella cases in the Japanese outbreak occurred among males ages 20 to 39 years, indicating the weakness of an initial strategy that provided the rubella vaccine only to adolescent girls [11]. In 2012, Poland and Romania also experienced rubella outbreaks that predominantly affected males as a result of a vaccination strategy that initially focused on vaccination of females [11,12]. A past review of rubella is available addressing CRS and postnatally acquired rubella, immune responses to rubella [13,9].

Rubella is preventable with the rubella vaccine with a single dose being more than 95% effective. Often it is given in combination with the measles vaccine and mumps vaccine, known as the MMR vaccine [14]. When some, but less than 80%, of a population, is vaccinated, more women may reach childbearing age without developing immunity by infection or vaccination, thus possibly raising CRS rates. Once infected there is no specific treatment [14,15,16].

Rubella vaccine, a live-virus preparation (strain RA 27/3) grown in human diploid cell cultures, is immunogenic in 98% of recipients and appears to provide more than 90% of them with lifelong immunity [17]. Although rubella vaccine is available in a monovalent formulation, the Committee on Infectious Diseases of the American Academy of Pediatrics (AAP) recommends that it be administered routinely in combination with the mumps and measles vaccines (MMR) to children at 12 to 15 months of age and again at 4 to 6 years of age, before they begin school [18]. If missed, the second dose should be administered as soon as possible before the age of 11 to 12 years. Aside from its routine administration in childhood, the rubella vaccine (preferably as MMR) also is recommended in the following circumstances for adults who do not have documented immunity [19]. Women of child-bearing age, unless they are pregnant .People who attend or work in educational institutions, child care centers, or

other settings in which exposure to and spread of rubella is likely [20]. Health-care workers who are likely to be exposed to or spread rubella Administration of rubella vaccine to patients receiving high doses of corticosteroids for 14 days or more should be delayed by at least 1 month from the termination of corticosteroid therapy [21]. Delay also is recommended for patients who have received immunoglobulin if MMR is to be used. Vaccination should be postponed for 3 to 11 months because immunoglobulin, especially in high doses, can inhibit the response to the measles vaccine for long periods [22]. Adverse reactions to the rubella vaccine include fever, rash, mild lymphadenopathy, arthralgia/arthritis, and thrombocytopenia (after immunization with MMR). Between 5% and 15% of children develop a fever after MMR. Because the fever associated with the rubella vaccine occurs from 5 days to 2 weeks after immunization, it is difficult to determine how often such fevers result from the vaccine rather than an intercurrent illness [23]. Joint manifestations, which almost always are transient, usually occur 1 to 3 weeks after rubella vaccination and are much more common in postpubertal women than in children. The vaccine is contraindicated for immunocompromised children and pregnant women [24]. However, children who have human immunodeficiency virus (HIV) infection should be immunized with MMR even if they are symptomatic unless the immunocompromise is severe.

Current recommendations of the Committee on Infectious Diseases of the AAP specify that the rubella vaccine not be administered to pregnant women or to women who are considering pregnancy within 3 months after receiving the vaccine [18]. The Centers for Disease Control and Prevention (CDC) followed women who received the rubella vaccine in the first trimester of pregnancy or within 3 months before becoming pregnant. Of 215 infants born to women known to be susceptible at the time of vaccination, nine had serologic evidence of intrauterine infection. Only one of these infants belonged to the subset of 121 infants whose mothers received the RA 27/3 vaccine currently used in the United States. None of the infants had evidence of defects consistent with congenital rubella syndrome at birth or at follow-up examinations [25-31]. Although the recommendation to avoid the use of the rubella vaccine during pregnancy remains, to date there is no reported case of congenital rubella syndrome linked to the vaccine virus [31,32,33]. In Brief on rubella vaccine, it has been mentioned about the safety of MMR for children infected with HIV, even if they are symptomatic. At that time, no case of vaccine induced measles had been described among HIV-infected children. That now has changed [34,35].

However, the risk from natural disease, as the measles epidemic in the late 1980s proved, remains so much greater than from the vaccine virus that the recommendation to immunize still stands, with the exception now of children who by CDC criteria are “severely” immunocompromised (CD4 T cells 15%) [35,36,37]. The syndrome of congenital rubella may include intrauterine growth failure with microcephaly and mental retardation; deafness; corneal clouding, cataracts, and chorioretinitis; cardiac malformations and myocarditis; thrombocytopenic purpura; hepatosplenomegaly; interstitial pneumonitis; metaphyseal bone lesions; and a propensity for insulin-dependent diabetes mellitus [38, 39,40]. The purpose of this study is to give an expert update on worldwide emphasizing issues with the prevention of CRS and new techniques in laboratory diagnostics; novel information regarding the immunogenetics of rubella vaccine-induced immune responses and also about the vaccine.

2. MATERIALS AND METHODS

A cross sectional study was done on a high-risk group like girls. The survey was conducted among the 100 undergraduate and postgraduate students randomly. This was conducted among students saveetha dental college from december,2019 to january, 2020. They were given a questionnaire to access their knowledge about the rubella viral infection and the issues related to infertility. The data were collected and then analyzed through SPSS software. Descriptive statistical analysis was carried out and the chi-square test was used and the p-value was calculated. The limitations of this study were that it was carried out in one institution only by convenience sampling or non probability sampling with a small sample size because of the small population of girls.

AWARNESS OF RUBELLA VACCINE

NAME. :-
YEAR OF STUDY:-
AGE. :-
1.Are you aware of rubella infection?
a. Yes. b.No
2.whether it is bacteria or virus?
a. Bacteria. b.virus.
3.Do you know who are affected?
a.yes. b.no
4.Have you taken a vaccine?
a.yes. b.No
5.Do you know when was the vaccine dose given?
a.yes. b.no
6.Do you know the significance of rubella infection in young adult?
a.yes. b.no
7.Do you know the social consequences of rubella in marital life?
a.yes. b.no
8.Do you know that female infertility is related to poor rubella immunity?
a.yes. b.no
9.Do you know that congenital malformation are common in rubella?
a.yes. b.no
10.Do you know rubella vaccine at your teen age will prevent infertility issues?
a.yes. b.no

Chart 1. Awareness of rubella vaccine

3. RESULTS AND DISCUSSION

After giving some set of questions to the college girls, the results provide us that, Fig. 1 40% are Undergraduate Students and 60% are Postgraduate students who participated in the survey. 76% of the college girls who participated in the survey are aware of rubella infection and 24% of them are unaware. 59% of the participants answered that they are aware of who is getting affected mostly with these rubella infections and 41% of them are unaware. 34% of them have taken the vaccine dose but 66% responded that they have not taken the vaccine. 19% of them responded that they are well known about the timings of vaccination dose and 81% of them are unaware of the timings of vaccine dose. 50% of the participants responded that they are aware of the significance of rubella infection in young adults and 50% of them are unaware. 55% of them are known for the social consequences of rubella infection in marital life and 45% of them are unaware of these social consequences. 22% of them are aware of female infertility related to poor rubella immunity and 78%of them are unaware. 42% of the participants are aware of congenital malformations in rubella and 58% of them are unaware of these congenital malformations. 30% are aware of the rubella vaccine can prevent infertility issues at teenagers and 70% of them are unaware of the rubella vaccine prevention. Fig. 2 The association between Education status of participants and Whether rubella is bacteria or virus. X axis represents Education status and the Y-axis represents the number of participants who responded whether it's a bacteria or virus. Chi-square test was done and the association found to be statistically significant. Pearson's chi-square test showing $p=0.005.(<0.05)$hence statistically significant, proving PG's had better knowledge about rubella than UG's. (Table 1) Fig. 3 The association between Education status of participants and the significance of rubella infections among young adults. X axis represents Education status and the Y-axis represents the number of participants who responded that they are aware or unaware. Chi-square test was done and the association found to be statistically significant. Pearson's chi-square test showing $p=0.005.(<0.05)$hence statistically significant, proving UG's had better knowledge about the significance of rubella than PG's. (Table 2) Fig. 4 The association between Education status of participants and social consequences of rubella in marital life. X axis represents Education status

and the Y-axis represents the number of participants who responded that they are aware or unaware. Chi-square test was done and the association found to be statistically significant. Pearson's chi-square test showing p=0.005.(<0.05)hence statistically significant, proving UG's had better knowledge about the social consequences of rubella in marital life than PG's. (Table 3) Fig. 5 The association between Education status of participants and Female infertility related to poor rubella immunity. X axis represents Education status and the Y-axis represents the number of participants who responded that they are aware or unaware. Chi-square test was done and the association found to be statistically significant. Pearson's chi-square test showing p=0.005.(<0.05) hence statistically significant, proving UG's had better knowledge about Female infertility related to poor rubella immunity than PG's.(Table 4) Fig. 6 The association between Education status of participants and Congenital malformations are common in Rubella. X axis represents Education status and the Y-axis represents the number of participants who responded that they are aware or unaware. Chi-square test was done and the association found to be statistically significant. Pearson's chi-square test showing p=0.005.(<0.05)hence statistically significant, proving UG's had better knowledge about the Congenital malformations are common in Rubella than PG's (Table 5).

Fig. 2 Bar graph represents the association between Education status of participants and Whether rubella is bacteria or virus. X axis represents Education status and the Y-axis represents the number of participants who responded. Blue represents bacteria, green represents viruses. Chi-square test was done and the association found to be statistically significant. Pearson's chi-square test showing p=0.005.(<0.05)hence statistically significant, proving PG's had better knowledge about rubella than UG's.

Fig. 3 Bar graph represents the association between Education status of participants and the awareness of rubella infections among young adults. X axis represents Education status and the Y-axis represents the number of participants. Blue represents yes, green represents no. Chi-square test was done and the association found to be statistically significant. Pearson's chi-square test showing p=0.005.(<0.05)hence statistically significant, proving UG's had better knowledge about the significance of rubella than PG's.

Fig. 4 Bar graph represents the association between Education Status of participants and social consequences of rubella in marital life. X axis represents Education status and the Y-axis represents the number of participants who responded that they are aware or unaware. Blue represents yes, green represents no. Chi-square test was done and the association found to be statistically significant. Pearson's chi-square test showing p=0.005.(<0.05)hence statistically significant, proving UG's had better knowledge about the social consequences of rubella in marital life than PG's.

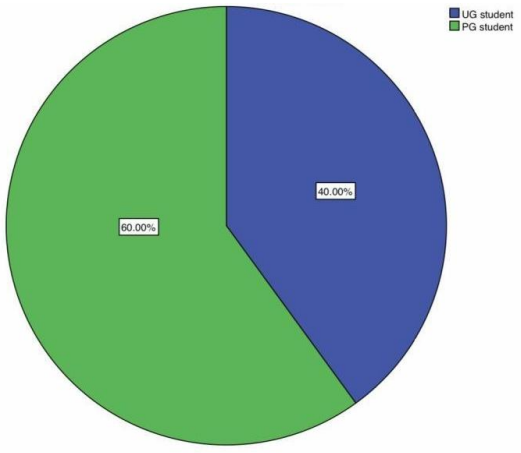

Fig. 1. Pie chart represents that 40% (blue) are UG students and 60% (green) are PG students who participated in the survey

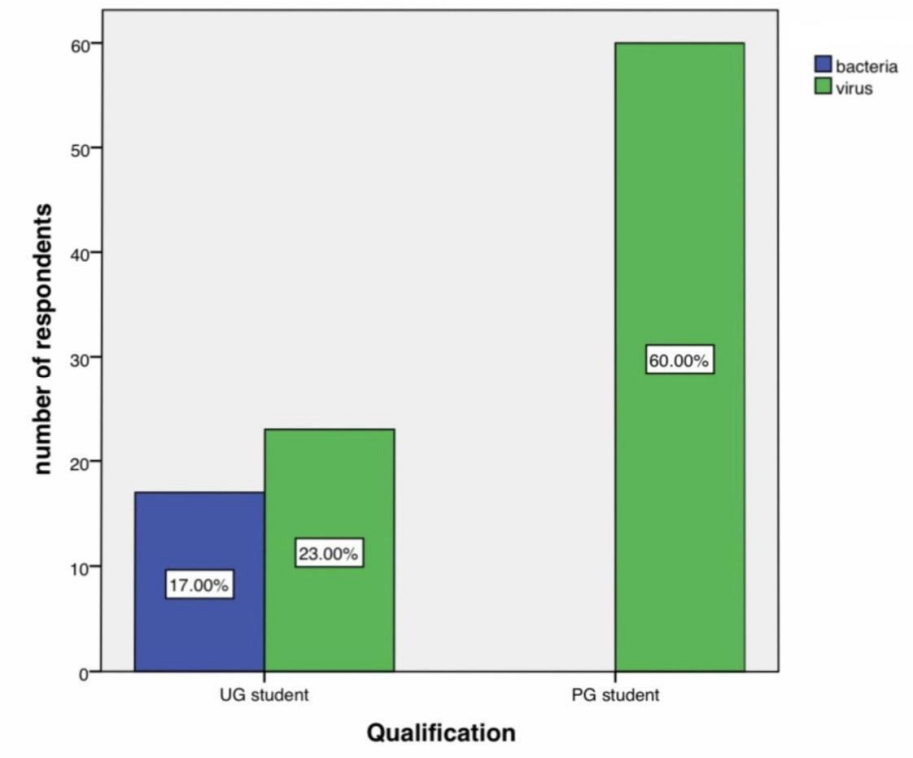

Fig. 2. Correlation between educational status and response of whether it is bacteria or virus

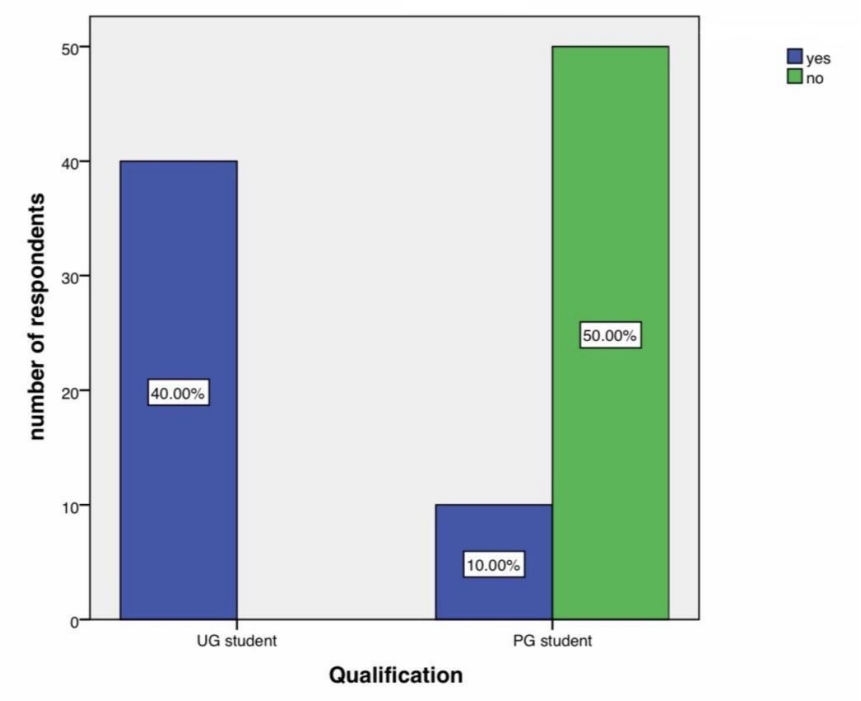

Fig. 3. Correlation between educational status and awareness of rubella infection

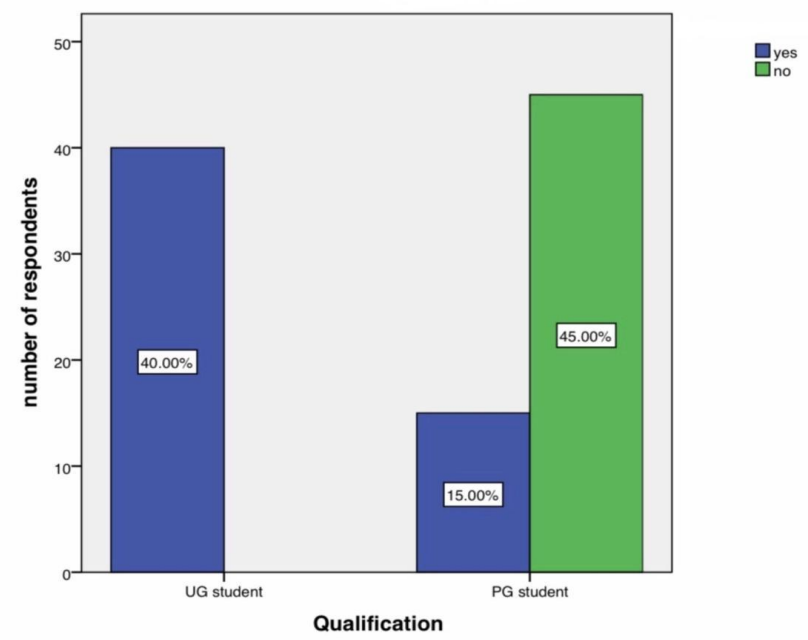

Fig. 4. Correlation between educational status and social consequences

Table 1. Variables whether Rubella is a bacteria or virus

Education status (X-axis)	Undergraduate student		Postgraduate student	
	Bacteria	Virus	Bacteria	Virus
Percentage of response (Y-Axis)	17%	23%	0%	60%

Table 2. Variables of awareness of rubella vaccine

Education status (X-axis)	Undergraduate student		Postgraduate student	
	Aware	Unaware	Aware	Unaware
Percentage of response (Y-Axis)	40%	0%	10%	50%

Table 3. Variables of awareness of social consequences of rubella in marital life

Education status (X-axis)	Undergraduate student		Postgraduate student	
	Aware	Unaware	Aware	Unaware
Percentage of response (Y-Axis)	40%	0%	15%	45%

Table 4. Variables of awareness of female infertility related to poor rubella immunity

Education status (X-axis)	Undergraduate student		Postgraduate student	
	Aware	Unaware	Aware	Unaware
Percentage of response (Y-Axis)	22%	18%	0%	60%

Table 5. Variables of awareness of congenital malformations in rubella

Education status (X-axis)	Undergraduate student		Postgraduate student	
	Aware	Unaware	Aware	Unaware
Percentage of response (Y-Axis)	40%	0%	2%	58%

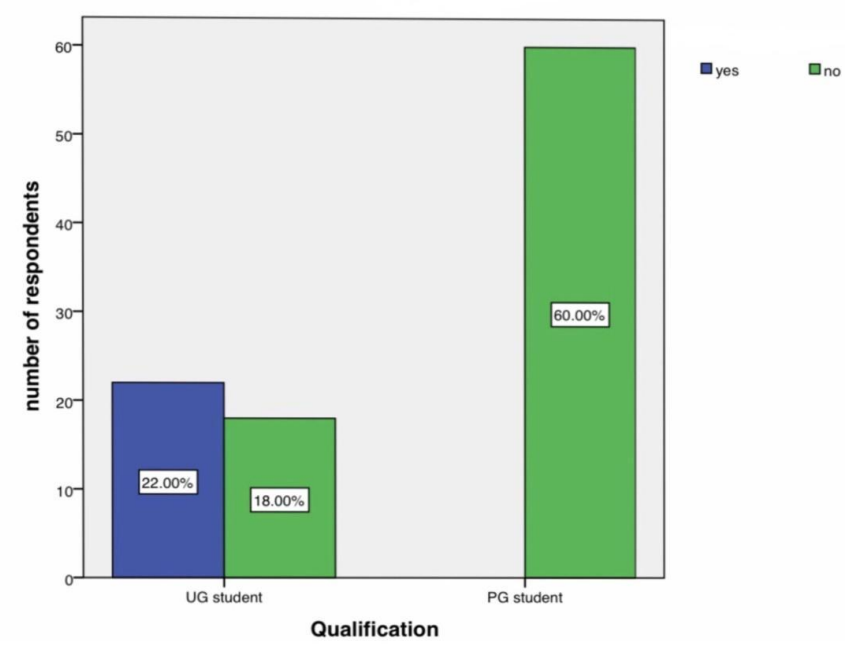

Fig. 5. Correlation between educational status and female infertility

Fig. 5 Bar graph represents the association between Education status of participants and Female infertility related to poor rubella immunity. X axis represents Education status and the Y-axis represents the number of participants who responded that they are aware or unaware. Blue represents yes, green represents no. Chi-square test was done and the association found to be statistically significant. Pearson's chi-square test showing p=0.005.(<0.05)hence statistically significant, proving UG's had better knowledge about the Female infertility related to poor rubella immunity than PG's.

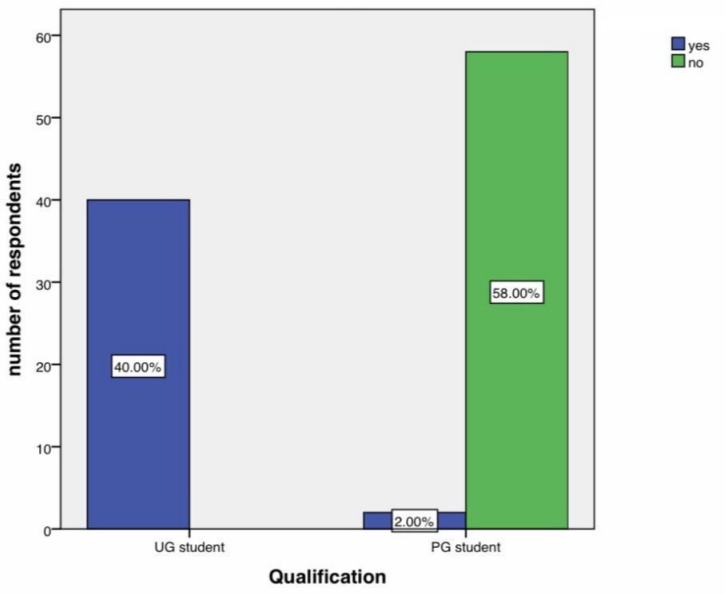

Fig. 6. Correlation between educational status and congenital malformations

Fig. 6 Bar graph represents the association between Education status of participants and Congenital malformations are common in Rubella. X axis represents Education status and the Y-axis represents the number of participants who responded that they are aware or unaware. Blue represents yes, green represents no. Chi-square test was done and the association found to be statistically significant. Pearson's chi-square test showing p=0.005.(<0.05)hence statistically significant, proving UG's had better knowledge about the Congenital malformations are common in Rubella than PG's.

4. CONCLUSION

According to this study, it is observed that these girls are not much aware of the rubella virus and its infections. It is also found that the information they have on the consequence of the persistence of rubella in them is abstract. The real impact on their life is not understood by many. This is evident with their willingness to get immunized at the risky part of their life. This can be mitigated by conducting regular awareness camps in schools, colleges, and their workplace.

5. LIMITATION OF THE STUDY

The limitations of this study were that it was carried out in one institution only by convenience sampling or nonprobability sampling with a small sample size because of the small girl population.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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