

# KNOWLEDGE, ATTITUDE, PRACTICES (KAP) STUDY AMONG MEDICAL PRACTITIONERS REGARDING ORAL MANIFESTATIONS OF HIV IN MANGALORE

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## ABSTRACT:

**Background:** The virulent human immunodeficiency virus (AIDS) and the acquired immunodeficiency syndrome (AIDS) have profoundly affected every aspect of the public health sector. Medical practitioners are paramount in patient care. Knowledge of the oral manifestations of the diseases is crucial in diagnosis. Lack of awareness of oral manifestations of HIV can result in not only a misdiagnosis but also in crossinfection.

**Aim:** To assess the level of knowledge, attitude and practices regarding oral manifestation of HIV among medical practitioners in Mangalore.

**Methods:** A cross sectional survey was conducted with an anonymous self administered questionnaire among 100 medical practitioners in Mangalore including house surgeons, post graduate students and practicing physicians.

**Results:** The medical practitioners including practicing physicians and post graduate students showing satisfactory knowledge with the medical house surgeons showing limited knowledge. A total of 81% doctors reported the most common mode of transmission as sexual. 65% of doctors felt that oral hairy leukoplakia is the most common premalignant lesion. Only 52 % agreed that all forms of candidiasis are seen and only 54% felt dental referral was compulsory.

**Conclusion:** Overall knowledge was satisfactory but deficiency among medical house surgeons indicate that knowledge reinforcement at an earlier age may result in better attitude and practices as clinicians.

**Key words:** HIV, AIDS, Knowledge, Attitude, Practices, medical practitioners



## INTRODUCTION:

AIDS is a silent but deadly disease of the immune system. In 2012, 35.3 million people were globally living with HIV and 1.6 million people died from AIDS-related illness<sup>[1]</sup> India, one of the most populated countries in the world has over one billion

inhabitants of which nearly 2.1 million people are currently suffering with HIV. The adult HIV prevalence at national level has continued its steady decline from estimated level of 0.41% in 2001 to 0.27% in 2011. But still, India is estimated to have the third highest number of

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estimated people living with HIV/AIDS, after South Africa and Nigeria. However, India is now ranked second globally in terms of total number of people receiving life-saving drugs [1].

Oral disease represents an important health problem in terms of diagnostic, prognostic and therapeutic implications for HIV infected individuals [2]. These findings can serve as highly predictive markers of severe immunosuppression and disease progression [3]. The quality of life is compromised in such individuals, and a need to alleviate their distress and improve patients comfort arises. Medical practitioners may often be the first to see and manage such cases and play major role in patient counselling and education regarding the complications associated with HIV infection [4]. Primary prevention of HIV/AIDS is through improving awareness and attitudes among medical practitioners [5]. Willingness to treat patients with HIV/AIDS appears to be related to knowledge of the disease process, its oral manifestations and modes of transmission, thus influencing health workers' attitudes and practices they have regarding these conditions could determine the type and quality of healthcare the patient may receive [6,7]. Therefore, it is imperative to gauge the level of HIV/AIDS knowledge at regular interval so as to provide feedback to planners for fine tuning the educational activities [8].

Hence this study was done with the aim of determining the knowledge, attitude and amongst medical practitioners including

the house surgeons, post graduate students and practicing physicians in Mangalore regarding oral manifestations of HIV/AIDS patients

## **MATERIAL AND METHODS:**

Ethical clearance was obtained from the Ethical Committee, Nitte. A cross sectional survey was conducted among 100 Medical professionals between Aug 15<sup>th</sup> to Nov 30<sup>th</sup>, 2013. Participants of this study were randomly selected among medical House surgeons, Post Graduate students and Practicing physicians in Mangalore. In order to eliminate a non-response participants were informed that the specially designed questionnaire was for research purposes only and was strictly anonymous to maintain confidentiality. Participation in the study was voluntary. They were given a self-administered multi-choice questionnaire containing 14 questions with various options to answer. It was structured to include Knowledge testing questions like prevalence of HIV, the most common modes of transmission of HIV, first appearing oral lesions and type of candidiasis present. The attitude of dealing with distressed patients and dental referrals were assessed along with their opinion regarding their skill to treat the patients. Practices on management of oral lesions were probed. Open ended questions regarding the number of oral lesion treated in the past one month were recorded.

**Statistical Analysis:** Once the forms were collected, Data was entered in an MS Excel spreadsheet and analyzed through

SPSS16. Results were expressed as number and percentages of respondents for each question for each group of medical practitioners. Fischer Chi-square tests with  $p < 0.001$  were considered significant.

## RESULTS:

The total number of respondents were 100 of which 28 were medical house surgeons, 44 practicing physicians and 28 medical house surgeons.(Table 1 ;Fig 1)

A total of 37% of persons answered HIGH and 40 % answered LOW and the remaining 28% did not know the answer. There is highly significant difference seen. (Table 2 ; Fig 2)

The most common mode of HIV transmission was recorded as sexual by all groups of doctors with 89.3% medical practitioners giving that answer followed by 84.1% postgraduates and 67.9 house surgeons.. There is no significant difference among groups.(Table 3A & 3B; Fig 3) 67.9% of physicians and 54.5% of postgraduate students and 67.9% of medical house surgeons graded linear gingival erythema as the first appearing periodontal disease. (Table 4A & 4B; Fig 4) 65% of doctors felt that Oral hairy leukoplakia is the most common premalignant lesion followed by 20% who felt Kaposi Sarcoma was the most common and 15% who felt NHL is the most common. There was no statistically significant difference. (Table 5A & 5B; Fig 5)

Parotid gland enlargement was the first condition to appear as reported by 49 % of participants followed by cervical caries as reported by 35% followed by xerostomia as reported by 16%. There is no statistically significant difference seen. (Table 6A & 6B; Fig 6)

54.5% of doctors felt all forms of candidiasis can appear in HIV patients. Results were not statistically significant. (Table 7A & 7B; Fig 7)

74% of participants had seen a HIV patient. 92.9% of physicians had seen a HIV patient. There is significant difference among groups seen. (Table 8A & 8 B; Fig 8)

Only 50% felt they had sufficient skill to treat the HIV patient and 28.6% felt they had no skills to treat. (Table 9A & 9B; Fig 9)

Overall 54.8% felt dental referral was compulsory. There is significant difference seen. (Table 10A & 10B; Fig 10)

85% felt that all options (confidentiality, stress free environment and counselling) should be done while dealing with HIV patient. There is no significant difference among groups. (Table 11A & 11B; Fig 11)

A total of 74% never saw any Oral lesions with the remaining 26% had seen a mean of 4.730 lesions .(Table 12)

Overall of 41% doctors said HAART is requires while 48% felt both HAART and treatment of individual lesions are necessary.

(Table 13A1, 13A2, 13B1, 13B2, 13C1, 13C2, 13D1, 13D2; Fig 13)

There is significant difference seen among the groups of practitioners regarding the seminars/ workshops recently attended. (Table 14A & 14B; Fig 14)

## DISCUSSION:

It was believed that HIV was transmitted from the apes and primates in the African jungles to humans. The plausible explanation for the mode of transmission was the "Hunter theory" where the early hunters got either bitten by these primates or the "Bush meat theory" where they contacted the contaminated blood during butchering. However some researchers refute this mode of transmission and hence the transmission to humans is not clearly understood [8].

The knowledge for this study population refers to their understanding of the oral manifestations of HIV. The attitudes are their feelings and pre-conceived ideas towards oral manifestations. The practices refer to the ways in which they demonstrated their knowledge and attitudes through their actions.

National AIDS Control Organisation conducts HIV Sentinel Surveillance and HIV Estimation at regular intervals [9]. Based on the HIV Estimation 2012, India has demonstrated an overall reduction of 57% in the annual new HIV infections (among adult population) from 2.74 lakhs in 2000 to 1.16 lakhs in 2011, reflecting the impact of various interventions and scaled-up prevention [10]. strategies under

the National AIDS Control Programme. Karnataka is estimated to have an adult (15–49 years) HIV prevalence rate of 0.52, which is higher than the national prevalence rate of 0.27 [11]. Dakshin Kannada district has moved towards 0.25% prevalence, which is half of the state's estimated adult HIV prevalence [11].

A total of 37% of persons answered HIGH and 40 % answered LOW and the remaining 28% did not know the answer. The contradicting answers may reflect the overall poor knowledge of demographics.

Today the most common mode of transmission is due to HIV is by unsafe sexual practices, through the exchange of body fluids (especially infected semen during intercourse); by non-sexual means, via the parenteral transfer of infected blood like that can occur when drug abusers share needles; or through vertical transmission to infants born of infected mothers. Any person coming in contact with the blood of the patient, such as the health care worker is always at risk for contracting the disease. The mode of transmission of HIV was earlier due to unsafe medical practices such as use of unsterilized needles during mass vaccination [1,12,13]. Infection from blood and blood product transfusion is almost eliminated due to increasingly stringent rules regarding HIV testing of donor blood. Transmission from health care workers to patients is very rare. Conversely, seroconversion has been documented in 103 health care workers (majority of which were nurses) following occupational injury, usually

related to management of patients with high plasma viral loads. Casual contact (shaking hands, hugging, casual kissing, etc.) or insect bites has not been shown to transmit HIV [12].

The most common mode of HIV transmission was recorded as sexual (unprotected encounters) by all groups of doctors with 89.3% medical practitioners giving that answer followed by 84.1% postgraduates and 67.9 house surgeons. An overall of 81% answered sexual method. This is in concordance with a study which assessed the knowledge of healthcare workers and 99.6% answered sexual mode [14].

62% of medical practitioners graded linear gingival erythema as the first appearing periodontal disease. This was followed by ANUG and ANUP by physicians and house surgeons while the postgraduates recorded the second most common disease as ANUP followed by ANUG. Linear gingival erythema appears as a 1–3 mm band of marginal gingival erythema, associated with no symptoms or only mild gingival bleeding and mild pain has been described in HIV positive individuals [16]. This may serve as a precursor to Necrotizing ulcerative gingivitis which is characterized by ulceration and necrosis of the interdental papilla [12]. It may progress to develop Necrotizing ulcerative periodontitis which is characterized by generalized deep osseous pain, and rapidly progressive destruction of the periodontal attachment and bone [16,20].

65% of doctors felt that Oral hairy leukoplakia (OHL) is the most common premalignant lesion followed by 20% who felt Kaposi Sarcoma was the most common and 15% who felt NHL is the most common. Although originally postulated to be pathognomonic for HIV infection, OHL has subsequently been reported in other immune deficiency states as well as in immunocompetent individuals. It appears as an asymptomatic adherent white patch with vertical corrugations, most commonly on the lateral borders of the tongue [16]. Kaposi's sarcoma (KS) is the most common intraoral malignancy associated with HIV infection.

Recognition of the lesion is essential, since oral KS is often the first manifestation of the disease. The lesion may appear as a red-purple macule, an ulcer, or as a nodule or mass and intraorally occurs on the heavily keratinized mucosa, the palate being the site in more than 90% of reported cases [16]. Non Hodgkins Lymphoma (NHL) is the most common lymphoma associated with HIV infection and is usually seen in late stages with CD4 lymphocyte counts of less than 100/mm<sup>3</sup>. It appears as a rapidly enlarging mass, less commonly as an ulcer or plaque, and most commonly on the palate or gingivae [16].

In studies done in US and UK, KS and OHL were commonly seen whereas in an Indian study Oral hairy leukoplakia was found to be uncommon but occasionally seen whereas NHL and KS were not seen at all [1]. In a study done on a Nigerian population OHL was seen only 1.3% of times and Kaposi sarcoma and NHL not

seen at all. This disparity could be due to socio-demographic, cultural, HAART availability and variations in reporting pattern<sup>[18]</sup>.

Overall of 49% felt there could be parotid gland enlargement, 35% felt they could be xerostomia and 16% felt there could be cervical caries. HIV infection is associated with parotid gland disease, characterized clinically by gland enlargement and diminished flow<sup>[17]</sup>. The enlargement typically involves the tail of the parotid gland or, less commonly, the submandibular gland, and it may present uni- or bi-laterally with periods of increased or decreased size<sup>16</sup>. Xerostomia is common in HIV disease due to salivary gland hypofunction as well as due to medications taken by patients with HIV infection. The oral dryness presents a significant risk factor for cervical caries and can lead to rapid dental deterioration<sup>[20]</sup>.

Only 54.5% of doctors felt all forms of candidiasis cannot appear together in HIV patients. The most common HIV related oral disorder is oral candidiasis which occurs in 17-43% cases with HIV infection and in more than 90% of cases with AIDS. Four types of oral candidiasis are found clinically-atrophic, pseudomembranous, hyperplastic, or chronic and angular cheilitis. While all forms of oral candidiasis are associated with low CD4<sup>+</sup> cell count, the pseudomembranous variety is correlated with progressive immune deterioration with CD4<sup>+</sup> counts less than 200 cells/mm<sup>3</sup><sup>[19]</sup>.

*Pseudomembranous candidiasis* ("thrush") presents as painless or slightly sensitive, yellow-white curdlike lesions that can be readily scraped and separated from the surface of the oral mucosa. This type is most common on the hard and soft palate and the buccal or labial mucosa but can occur anywhere in the oral cavity. *Erythematous candidiasis* may be present as a component of the pseudomembranous type, appearing as red patches on the buccal or palatal mucosa, or it may be associated with depapillation of the tongue. *Hyperplastic candidiasis* is the least common form and may be seen in the buccal mucosa and tongue. It is more resistant to removal than the other types. In *angular cheilitis* the commissures of the lips appear erythematous with surface crusting and fissuring<sup>[12]</sup>. All three of these common forms may appear in one individual<sup>[15]</sup>.

One of the earliest studies to determine the HIV/AIDS Knowledge, Attitude and Practices (KAP) of oral health workers was published in 1992 by Darling, Arendorf and Samaranayake. The study was carried out among 1000 South African dentists. A significant proportion of the respondents mentioned the commonly seen oral manifestations of HIV/AIDS as oral candidiasis (76%), Kaposi Sarcoma (74%), herpes infection (46%), hairy leukoplakia (34%) and ulcerative gingivitis (32%)<sup>[21]</sup>.

According to study done in 2012 on the south Indian population, the most common manifestation observed in a majority of the 50 HIV-infected patients was candidiasis<sup>[22]</sup>. Similar observations

were made by Sharma *et al*<sup>[23]</sup>. Oral hairy leukoplakia was observed in 2% of study group, which was considerably less compared to that reported in the studies done by Ranganathan *et al*<sup>[25]</sup>.

According to a study done in 2012 in Mangalore the prevalence of oral lesions among the investigated HIV patients was found to be 71%, with periodontitis – 52% and erythematous candidiasis – 48% being the most prevalent oral lesions; as well, periodontitis and oral hairy leukoplakia were found to be significantly associated with the immunosuppression in the disease <sup>[24]</sup>.

Only 50% felt they had sufficient skill to treat the HIV patient and 28.6% felt they had no skills to treat. This reflects a lack of confidence in the physicians probability due to deficits in HIV training.

Overall only 54.8%. Negative attitude regarding referring HIV patients to a dentist may be due to lack of awareness of the diagnostic value of oral lesions and the lack of priority for treatment of the same. Dental expertise is necessary for appropriate management of oral manifestations of HIV infection or AIDS, but many patients do not receive adequate dental care <sup>[26]</sup>.

In a study done in Nigeria in 2005, 12% of healthworkers agreed that treatment of opportunistic infections in HIV/AIDS patients wastes resources, and 8% indicated that treating someone with HIV/AIDS is a waste of precious resources <sup>[31]</sup>.

85% felt that maintenance of medical confidentiality, providing stress free treatment atmosphere and counselling or refer to Counselling centres should be done for HIV patients.

Education and counselling continue to be the main weapons for reducing the risk of infection and controlling the spread of HIV. Pretest counseling includes providing information about HIV and tests, risk assessment, risk prevention and prevention of HIV transmission. Post test counselling should include discussion of the medical, psychological, social, ethical and legal implications of HIV. The medical practitioner has to protect the confidentiality of a patient's HIV status<sup>[27]</sup>.

In this study only 74% of participants of which 92.9% of physicians had seen a HIV patient. A total of 74% never saw any Oral lesions with the remaining 26% had seen a mean of 4.730 lesions. This appears to be in contrast to a study done on prevalence of oral lesions among HIV patients which was found to be 71% in Mangalore<sup>[24]</sup>.

41% of medical practitioners felt that HAART alone is sufficient to treat oral manifestations whereas 9% felt treatment of individual lesions alone is sufficient and 48% felt both HAART and individual lesions should be treated. The use of HIV protease inhibitors combined with therapy targeting the HIV reverse transcriptase enzyme (highly active antiretroviral therapy or HAART) is associated with a sustained decrease in viral replication and stabilization or even an increase in the peripheral CD4+ T-

helper cell count, a subset of lymphocytes targeted by HIV<sup>[28]</sup>.

Greenspan<sup>[29]</sup> noted significant decreases in oral candidosis, hairy leucoplakia, and Kaposi's sarcoma over time, but no change in the occurrence of aphthous ulcers. There was an increase in salivary-gland disease and a striking increase in warts: three-fold for patients on antiretroviral therapy and six-fold for those on HAART. Other published reports show a marked increase in the number of oral warts in the HAART era <sup>[29,30]</sup>.

There is a broad consensus that persons with HIV should see a dentist regularly <sup>[4]</sup>Most commonly observed oral manifestations of HIV and recommended treatment <sup>[38]</sup>.35% had attended seminars/workshops regarding HIV/AIDS 55% had not attended recently whereas 10% had never attended any. In spite of workshops/seminars held in India including 6<sup>th</sup> National Conference of AIDS Society of India in December 2013, the percentage of doctors attending these are shockingly low. Within the classroom, one strategy for experimental learning identified by Seacat and Inglehart et al was the use of HIV/AIDS discussion panels. Students in that study reported a preference for such learning opportunities and indicated this type of experience would help them become more familiar with the patients they were treating <sup>[32]</sup>.

## CONCLUSION:

The results of this study cannot be generalised to the general population of medical practitioners due to a low sample

size. The study, however, gives further insight into the knowledge, attitudes and practices of this important group of health care workers.

To the best of our knowledge it is the only study that assesses the knowledge, attitudes and practices of medical practitioners regarding oral manifestations of HIV and compares a medical house surgeon group with a postgraduate student groups and a practicing physicians group.

HIV infection will have at least one oral manifestation at some time during the course of their disease. Recognition and management of these oral conditions is therefore important for the health and quality of life of the individual with HIV/AIDS. Although a majority of doctors were aware of the facts related to AIDS, and the spread and oral manifestations of HIV infection, there were considerable gaps in their knowledge with regard to the identification of oral manifestations and factors related to them. However people may have knowledge but that knowledge need not necessarily translate into their attitude and practices.

Education endeavours could be broadened to lay focus on oral lesions related to HIV and attitudes towards referring such patients to a dentist. Such training programs with particular attention to diagnosis and management of oral manifestations of HIV should be



directed on a continuous basis towards health care providers in Mangalore.

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**FIGURES & TABLES:**

| DESIGNATION |                       |           |         |
|-------------|-----------------------|-----------|---------|
|             |                       | Frequency | Percent |
| Valid       | MEDICAL HOUSE SURGEON | 28        | 28.0    |
|             | POSTGRADUATE          | 44        | 44.0    |
|             | PRACTICING PHYSICIAN  | 28        | 28.0    |
|             | Total                 | 100       | 100.0   |

TABLE 1 :Designation of medical practitioners

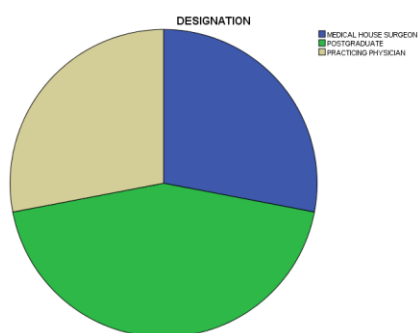


Fig 1: Designation of medical practitioners

|            |                      |                      | DESIGNATION           |              |                      | Total  |
|------------|----------------------|----------------------|-----------------------|--------------|----------------------|--------|
|            |                      |                      | MEDICAL HOUSE SURGEON | POSTGRADUATE | PRACTICING PHYSICIAN |        |
| PREVALENCE | HIGH                 | Count                | 16                    | 7            | 14                   | 37     |
|            |                      | % within PREVALENCE  | 43.2%                 | 18.9%        | 37.8%                | 100.0% |
|            |                      | % within DESIGNATION | 57.1%                 | 15.9%        | 50.0%                | 37.0%  |
|            | LOW                  | Count                | 11                    | 17           | 12                   | 40     |
|            |                      | % within PREVALENCE  | 27.5%                 | 42.5%        | 30.0%                | 100.0% |
|            |                      | % within DESIGNATION | 39.3%                 | 38.6%        | 42.9%                | 40.0%  |
|            | DONT KNOW            | Count                | 1                     | 20           | 2                    | 23     |
|            |                      | % within PREVALENCE  | 4.3%                  | 87.0%        | 8.7%                 | 100.0% |
|            |                      | % within DESIGNATION | 3.6%                  | 45.5%        | 7.1%                 | 23.0%  |
| Total      | Count                | 28                   | 44                    | 28           | 100                  |        |
|            | % within PREVALENCE  | 28.0%                | 44.0%                 | 28.0%        | 100.0%               |        |
|            | % within DESIGNATION | 100.0%               | 100.0%                | 100.0%       | 100.0%               |        |

Table 2 Prevalence of HIV according to the 3 groups of medical practitioners

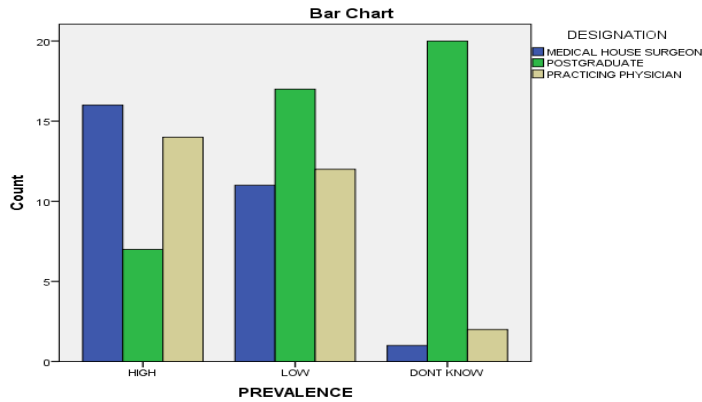


Fig 2: Prevalence of HIV according to the 3 groups of medical practitioners

Crosstab

|                                  |                              |                              | DESIGNATION           |              |                      | Total  |
|----------------------------------|------------------------------|------------------------------|-----------------------|--------------|----------------------|--------|
|                                  |                              |                              | MEDICAL HOUSE SURGEON | POSTGRADUATE | PRACTICING PHYSICIAN |        |
| MOST COMMON MODE OF TRANSMISSION | SEXUAL                       | Count                        | 19                    | 37           | 25                   | 81     |
|                                  |                              | % within TRANSMISSION RANK 1 | 23.5%                 | 45.7%        | 30.9%                | 100.0% |
|                                  |                              | % within DESIGNATION         | 67.9%                 | 84.1%        | 89.3%                | 81.0%  |
|                                  | BLOOD TRANSFUSION            | Count                        | 5                     | 2            | 3                    | 10     |
|                                  |                              | % within TRANSMISSION RANK 1 | 50.0%                 | 20.0%        | 30.0%                | 100.0% |
|                                  |                              | % within DESIGNATION         | 17.9%                 | 4.5%         | 10.7%                | 10.0%  |
|                                  | NEEDLE PRICK                 | Count                        | 3                     | 3            | 0                    | 6      |
|                                  |                              | % within TRANSMISSION RANK 1 | 50.0%                 | 50.0%        | 0.0%                 | 100.0% |
|                                  |                              | % within DESIGNATION         | 10.7%                 | 6.8%         | 0.0%                 | 6.0%   |
|                                  | VERTICAL                     | Count                        | 0                     | 1            | 0                    | 1      |
|                                  |                              | % within TRANSMISSION RANK 1 | 0.0%                  | 100.0%       | 0.0%                 | 100.0% |
|                                  |                              | % within DESIGNATION         | 0.0%                  | 2.3%         | 0.0%                 | 1.0%   |
|                                  | BLOOD                        | Count                        | 1                     | 0            | 0                    | 1      |
|                                  |                              | % within TRANSMISSION RANK 1 | 100.0%                | 0.0%         | 0.0%                 | 100.0% |
|                                  |                              | % within DESIGNATION         | 3.6%                  | 0.0%         | 0.0%                 | 1.0%   |
|                                  | OTHERS                       | Count                        | 0                     | 1            | 0                    | 1      |
|                                  |                              | % within TRANSMISSION RANK 1 | 0.0%                  | 100.0%       | 0.0%                 | 100.0% |
|                                  |                              | % within DESIGNATION         | 0.0%                  | 2.3%         | 0.0%                 | 1.0%   |
| Total                            | Count                        | 28                           | 44                    | 28           | 100                  |        |
|                                  | % within TRANSMISSION RANK 1 | 28.0%                        | 44.0%                 | 28.0%        | 100.0%               |        |
|                                  | % within DESIGNATION         | 100.0%                       | 100.0%                | 100.0%       | 100.0%               |        |

Table 3A :Most common mode of transmission

**Chi-Square Tests**

|                     | Value  | Exact Sig. (2-sided) |
|---------------------|--------|----------------------|
| Fisher's Exact Test | 11.531 | .183                 |
| N of Valid Cases    | 100    |                      |

Table 3B: Chi square tests

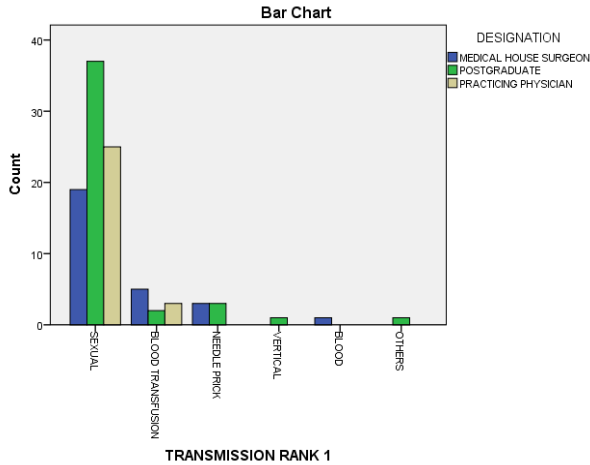


Fig 3 : :Most common mode of transmission

**PERIODONTAL \* DESIGNATION  
Crosstabulation<sup>a</sup>**

|                     |                          |                      | DESIGNATION           |              |                      | Total  |
|---------------------|--------------------------|----------------------|-----------------------|--------------|----------------------|--------|
|                     |                          |                      | MEDICAL HOUSE SURGEON | POSTGRADUATE | PRACTICING PHYSICIAN |        |
| PERIODONTAL DISEASE | ANUG                     | Count                | 7                     | 16           | 7                    | 30     |
|                     |                          | % within PARAMETER   | 23.3%                 | 53.3%        | 23.3%                | 100.0% |
|                     |                          | % within DESIGNATION | 25.0%                 | 36.4%        | 25.0%                | 30.0%  |
|                     | ANUP                     | Count                | 2                     | 4            | 2                    | 8      |
|                     |                          | % within PARAMETER   | 25.0%                 | 50.0%        | 25.0%                | 100.0% |
|                     |                          | % within DESIGNATION | 7.1%                  | 9.1%         | 7.1%                 | 8.0%   |
|                     | LINEAR GINGIVAL ERYTHEMA | Count                | 19                    | 24           | 19                   | 62     |
|                     |                          | % within PARAMETER   | 30.6%                 | 38.7%        | 30.6%                | 100.0% |
|                     |                          | % within DESIGNATION | 67.9%                 | 54.5%        | 67.9%                | 62.0%  |
| Total               | Count                    | 28                   | 44                    | 28           | 100                  |        |
|                     | % within PARAMETER       | 28.0%                | 44.0%                 | 28.0%        | 100.0%               |        |
|                     | % within DESIGNATION     | 100.0%               | 100.0%                | 100.0%       | 100.0%               |        |

Table 4A : First appearing periodontal disease

**Chi-Square Tests**

|                     |       |                      |
|---------------------|-------|----------------------|
|                     | Value | Exact Sig. (2-sided) |
| Fisher's Exact Test | 1.906 | .774                 |
| N of Valid Cases    | 100   |                      |

Table 4B: Chi square test

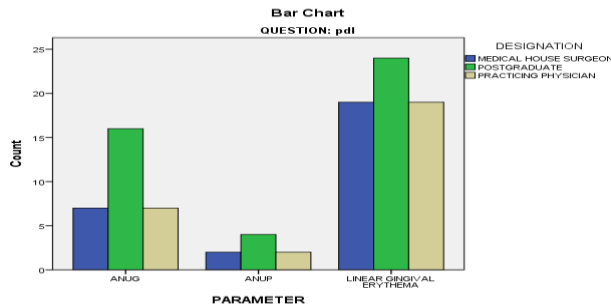


Fig 4: First appearing periodontal disease

**Crosstab**

|                |                        | DESIGNATION            |              |                      | Total  |        |
|----------------|------------------------|------------------------|--------------|----------------------|--------|--------|
|                |                        | MEDICAL HOUSE SURGEON  | POSTGRADUATE | PRACTICING PHYSICIAN |        |        |
| pre-malignant  | NHL                    | Count                  | 6            | 7                    | 2      | 15     |
|                |                        | % within pre-malignant | 40.0%        | 46.7%                | 13.3%  | 100.0% |
|                |                        | % within DESIGNATION   | 21.4%        | 15.9%                | 7.1%   | 15.0%  |
|                | ORAL HAIRY LEUKOPLAKIA | Count                  | 14           | 33                   | 18     | 65     |
|                |                        | % within pre-malignant | 21.5%        | 50.8%                | 27.7%  | 100.0% |
|                |                        | % within DESIGNATION   | 50.0%        | 75.0%                | 64.3%  | 65.0%  |
| KAPOSI SARCOMA | Count                  | 8                      | 4            | 8                    | 20     |        |
|                | % within pre-malignant | 40.0%                  | 20.0%        | 40.0%                | 100.0% |        |
|                | % within DESIGNATION   | 28.6%                  | 9.1%         | 28.6%                | 20.0%  |        |
| Total          | Count                  | 28                     | 44           | 28                   | 100    |        |
|                | % within pre-malignant | 28.0%                  | 44.0%        | 28.0%                | 100.0% |        |
|                | % within DESIGNATION   | 100.0%                 | 100.0%       | 100.0%               | 100.0% |        |

Table 5A: Most commonly seen pre-malignant lesion

**Chi-Square Tests**

|                     |       |                      |
|---------------------|-------|----------------------|
|                     | Value | Exact Sig. (2-sided) |
| Fisher's Exact Test | 8.619 | .068                 |
| N of Valid Cases    | 100   |                      |

Table 5B: Chi square tests

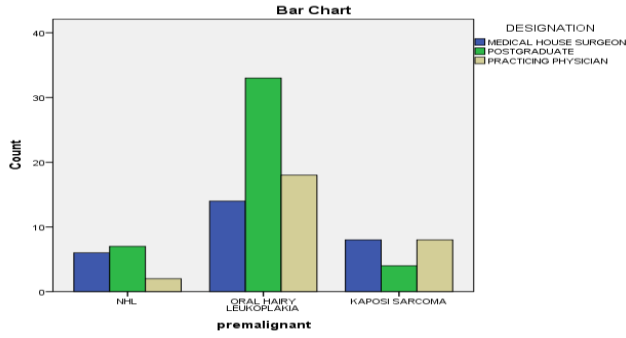


Fig 5: Most commonly seen premalignant lesion

Crosstab

|       |                           | DESIGNATION           |              |                      | Total  |        |
|-------|---------------------------|-----------------------|--------------|----------------------|--------|--------|
|       |                           | MEDICAL HOUSE SURGEON | POSTGRADUATE | PRACTICING PHYSICIAN |        |        |
| Other | CERVICAL CARIES           | Count                 | 12           | 14                   | 9      | 35     |
|       |                           | % within Other        | 34.3%        | 40.0%                | 25.7%  | 100.0% |
|       |                           | % within DESIGNATION  | 42.9%        | 31.8%                | 32.1%  | 35.0%  |
|       | PAROTID GLAND ENLARGEMENT | Count                 | 13           | 22                   | 14     | 49     |
|       |                           | % within Other        | 26.5%        | 44.9%                | 28.6%  | 100.0% |
|       |                           | % within DESIGNATION  | 46.4%        | 50.0%                | 50.0%  | 49.0%  |
| Total | XEROSTOMIA                | Count                 | 3            | 8                    | 5      | 16     |
|       |                           | % within Other        | 18.8%        | 50.0%                | 31.2%  | 100.0% |
|       |                           | % within DESIGNATION  | 10.7%        | 18.2%                | 17.9%  | 16.0%  |
|       | Count                     | 28                    | 44           | 28                   | 100    |        |
|       | % within Other            | 28.0%                 | 44.0%        | 28.0%                | 100.0% |        |
|       | % within DESIGNATION      | 100.0%                | 100.0%       | 100.0%               | 100.0% |        |

Table 6 A: First appearing lesion in HIV patient

Chi-Square Tests

|                     | Value | Exact Sig. (2-sided) |
|---------------------|-------|----------------------|
| Fisher's Exact Test | 1.448 | .850                 |
| N of Valid Cases    | 100   |                      |

Table 6 B: Chi square tests

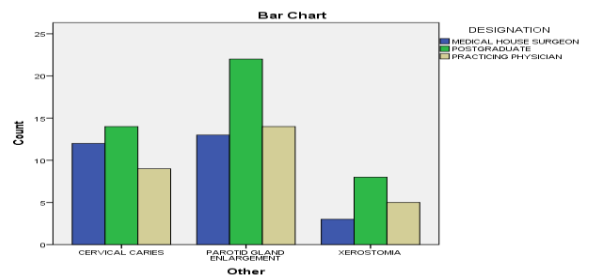


Fig 6: First appearing lesion in HIV patient



Crosstabulation

|                  |                      |                      | DESIGNATION           |              |                      | Total  |
|------------------|----------------------|----------------------|-----------------------|--------------|----------------------|--------|
|                  |                      |                      | MEDICAL HOUSE SURGEON | POSTGRADUATE | PRACTICING PHYSICIAN |        |
| CANDIDIASIS      | ALL                  | Count                | 9                     | 27           | 19                   | 55     |
|                  |                      | % within PARAMETER   | 16.4%                 | 49.1%        | 34.5%                | 100.0% |
|                  |                      | % within DESIGNATION | 32.1%                 | 61.4%        | 65.5%                | 54.5%  |
|                  | ANGULAR CHELITIS     | Count                | 7                     | 6            | 2                    | 15     |
|                  |                      | % within PARAMETER   | 46.7%                 | 40.0%        | 13.3%                | 100.0% |
|                  |                      | % within DESIGNATION | 25.0%                 | 13.6%        | 6.9%                 | 14.9%  |
|                  | ERYTHEMATOUS         | Count                | 8                     | 5            | 2                    | 15     |
|                  |                      | % within PARAMETER   | 53.3%                 | 33.3%        | 13.3%                | 100.0% |
|                  |                      | % within DESIGNATION | 28.6%                 | 11.4%        | 6.9%                 | 14.9%  |
|                  | HYPERPLASTIC         | Count                | 2                     | 4            | 5                    | 11     |
|                  |                      | % within PARAMETER   | 18.2%                 | 36.4%        | 45.5%                | 100.0% |
|                  |                      | % within DESIGNATION | 7.1%                  | 9.1%         | 17.2%                | 10.9%  |
| PSEUDOMEMBRANOUS | Count                | 2                    | 2                     | 1            | 5                    |        |
|                  | % within PARAMETER   | 40.0%                | 40.0%                 | 20.0%        | 100.0%               |        |
|                  | % within DESIGNATION | 7.1%                 | 4.5%                  | 3.4%         | 5.0%                 |        |
| Total            | Count                | 28                   | 44                    | 29           | 101                  |        |
|                  | % within PARAMETER   | 27.7%                | 43.6%                 | 28.7%        | 100.0%               |        |
|                  | % within DESIGNATION | 100.0%               | 100.0%                | 100.0%       | 100.0%               |        |

Table 7A: Forms of candidiasis seen in HIV patient

Chi-Square Tests<sup>a</sup>

|                     | Value  | Exact Sig. (2-sided) |
|---------------------|--------|----------------------|
| Fisher's Exact Test | 13.316 | .077                 |
| N of Valid Cases    | 100    |                      |

Table 7 B: Chi- square tests

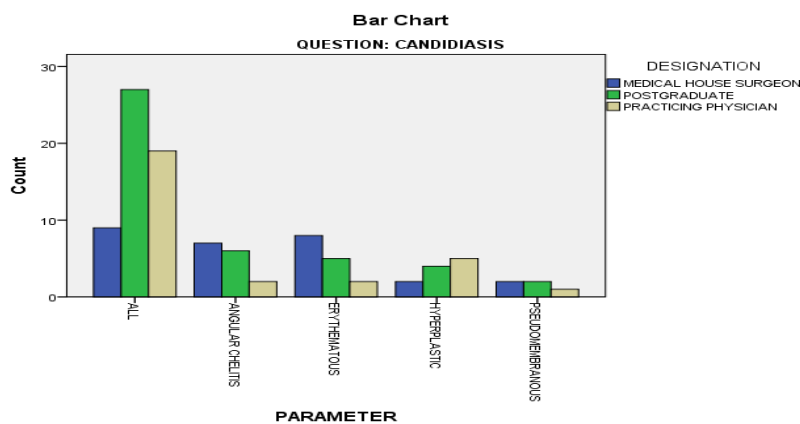


Fig 7 : Forms of candidiasis seen in HIV patient

**Crosstab**

|       |                      | DESIGNATION           |              |                      | Total  |        |
|-------|----------------------|-----------------------|--------------|----------------------|--------|--------|
|       |                      | MEDICAL HOUSE SURGEON | POSTGRADUATE | PRACTICING PHYSICIAN |        |        |
| Seen  | NO                   | Count                 | 8            | 16                   | 2      | 26     |
|       |                      | % within Seen         | 30.8%        | 61.5%                | 7.7%   | 100.0% |
|       |                      | % within DESIGNATION  | 28.6%        | 36.4%                | 7.1%   | 26.0%  |
|       | YES                  | Count                 | 20           | 28                   | 26     | 74     |
|       |                      | % within Seen         | 27.0%        | 37.8%                | 35.1%  | 100.0% |
|       |                      | % within DESIGNATION  | 71.4%        | 63.6%                | 92.9%  | 74.0%  |
| Total | Count                | 28                    | 44           | 28                   | 100    |        |
|       | % within Seen        | 28.0%                 | 44.0%        | 28.0%                | 100.0% |        |
|       | % within DESIGNATION | 100.0%                | 100.0%       | 100.0%               | 100.0% |        |

Table 8 A : Number of HIV cases seen by medical practitioners

**Chi-Square Tests**

|                     | Value | Exact Sig. (2-sided) |
|---------------------|-------|----------------------|
| Fisher's Exact Test | 8.307 | <b>.014</b>          |
| N of Valid Cases    | 100   |                      |

Table 8 B: Chi square tests

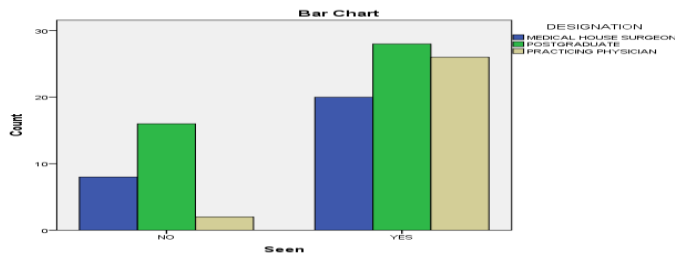


Fig 8 : Number of HIV cases seen by medical practitioners

**Crosstab**

|                |                      | DESIGNATION           |              |                      | Total  |        |
|----------------|----------------------|-----------------------|--------------|----------------------|--------|--------|
|                |                      | MEDICAL HOUSE SURGEON | POSTGRADUATE | PRACTICING PHYSICIAN |        |        |
| Skill To treat | YES                  | Count                 | 14           | 17                   | 19     | 50     |
|                |                      | % within Skill2treat  | 28.0%        | 34.0%                | 38.0%  | 100.0% |
|                |                      | % within DESIGNATION  | 50.0%        | 38.6%                | 67.9%  | 50.0%  |
|                | NO                   | Count                 | 10           | 17                   | 8      | 35     |
|                |                      | % within Skill2treat  | 28.6%        | 48.6%                | 22.9%  | 100.0% |
|                |                      | % within DESIGNATION  | 35.7%        | 38.6%                | 28.6%  | 35.0%  |
|                | DONT KNOW            | Count                 | 4            | 10                   | 1      | 15     |
|                |                      | % within Skill2treat  | 26.7%        | 66.7%                | 6.7%   | 100.0% |
|                |                      | % within DESIGNATION  | 14.3%        | 22.7%                | 3.6%   | 15.0%  |
| Total          | Count                | 28                    | 44           | 28                   | 100    |        |
|                | % within Skill2treat | 28.0%                 | 44.0%        | 28.0%                | 100.0% |        |
|                | % within DESIGNATION | 100.0%                | 100.0%       | 100.0%               | 100.0% |        |

Table 9 A: Skill to treat HIV patients

Chi-Square Tests

|                     | Value | Exact Sig. (2-sided) |
|---------------------|-------|----------------------|
| Fisher's Exact Test | 7.566 | .105                 |
| N of Valid Cases    | 100   |                      |

Table 9 B: Chi square tests

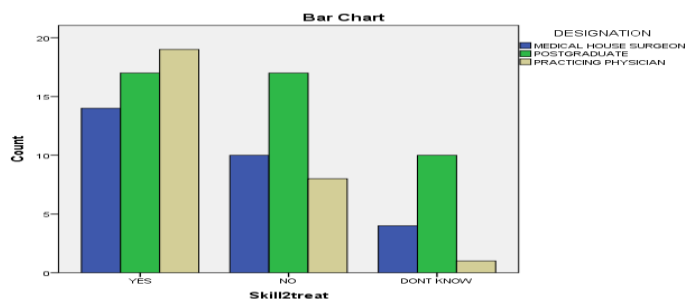


Fig 9: Skill to treat HIV patients

Crosstab

|                 |                      | DESIGNATION           |              |                      | Total  |        |
|-----------------|----------------------|-----------------------|--------------|----------------------|--------|--------|
|                 |                      | MEDICAL HOUSE SURGEON | POSTGRADUATE | PRACTICING PHYSICIAN |        |        |
| Dental Referral | COMPULSARY           | Count                 | 13           | 27                   | 14     | 54     |
|                 |                      | % within Dent Ref     | 24.1%        | 50.0%                | 25.9%  | 100.0% |
|                 |                      | % within DESIGNATION  | 46.4%        | 61.4%                | 50.0%  | 54.0%  |
|                 | OPTIONAL             | Count                 | 11           | 6                    | 1      | 18     |
|                 |                      | % within Dent Ref     | 61.1%        | 33.3%                | 5.6%   | 100.0% |
|                 |                      | % within DESIGNATION  | 39.3%        | 13.6%                | 3.6%   | 18.0%  |
|                 | ONLY IF INDICATED    | Count                 | 4            | 10                   | 12     | 26     |
|                 |                      | % within Dent Ref     | 15.4%        | 38.5%                | 46.2%  | 100.0% |
|                 |                      | % within DESIGNATION  | 14.3%        | 22.7%                | 42.9%  | 26.0%  |
|                 | NOT AT ALL NECESSARY | Count                 | 0            | 1                    | 1      | 2      |
|                 |                      | % within Dent Ref     | 0.0%         | 50.0%                | 50.0%  | 100.0% |
|                 |                      | % within DESIGNATION  | 0.0%         | 2.3%                 | 3.6%   | 2.0%   |
| Total           | Count                | 28                    | 44           | 28                   | 100    |        |
|                 | % within Dent Ref    | 28.0%                 | 44.0%        | 28.0%                | 100.0% |        |
|                 | % within DESIGNATION | 100.0%                | 100.0%       | 100.0%               | 100.0% |        |

Table 10 A :Dental Referral for HIV patients

Chi-Square Tests

|                     | Value  | Exact Sig. (2-sided) |
|---------------------|--------|----------------------|
| Fisher's Exact Test | 15.871 | <b>.006</b>          |
| N of Valid Cases    | 100    |                      |

Table 10 B: Chi square tests

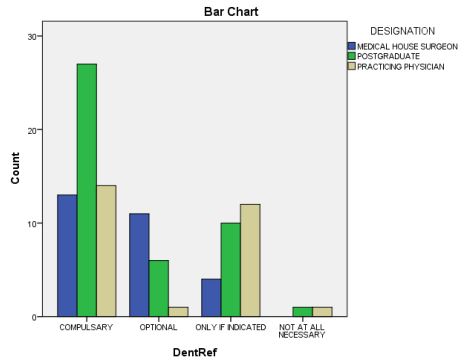


Fig 10 : Dental Referral for HIV patients

DEALING WITH HIV PATIENT\* DESIGNATION

Crosstab

|       |   | DESIGNATION           |              |                      | Total  |        |
|-------|---|-----------------------|--------------|----------------------|--------|--------|
|       |   | MEDICAL HOUSE SURGEON | POSTGRADUATE | PRACTICING PHYSICIAN |        |        |
| Deal  | a. Maintenance of medical confidentiality                 | Count                 | 0            | 1                    | 0      | 1      |
|       |   | % within Deal         | 0.0%         | 100.0%               | 0.0%   | 100.0% |
|       |   | % within DESIGNATION  | 0.0%         | 2.3%                 | 0.0%   | 1.0%   |
|       | b. Provide stress free treatment atmosphere               | Count                 | 5            | 2                    | 0      | 7      |
|       |   | % within Deal         | 71.4%        | 28.6%                | 0.0%   | 100.0% |
|       |   | % within DESIGNATION  | 17.9%        | 4.5%                 | 0.0%   | 7.0%   |
|       | c. Be prepared to counsel or refer to Counselling centres | Count                 | 3            | 3                    | 1      | 7      |
|       |   | % within Deal         | 42.9%        | 42.9%                | 14.3%  | 100.0% |
|       |   | % within DESIGNATION  | 10.7%        | 6.8%                 | 3.6%   | 7.0%   |
|       | d. ALL OF THE ABOVE                                       | Count                 | 20           | 38                   | 27     | 85     |
|       |   | % within Deal         | 23.5%        | 44.7%                | 31.8%  | 100.0% |
|       |   | % within DESIGNATION  | 71.4%        | 86.4%                | 96.4%  | 85.0%  |
| Total | Count   | 28                    | 44           | 28                   | 100    |        |
|       | % within Deal   | 28.0%                 | 44.0%        | 28.0%                | 100.0% |        |
|       | % within DESIGNATION                                      | 100.0%                | 100.0%       | 100.0%               | 100.0% |        |

Table 11 A: Dealing with HIV patient

Chi-Square Tests

|                     | Value | Exact Sig. (2-sided) |
|---------------------|-------|----------------------|
| Fisher's Exact Test | 9.117 | .091                 |
| N of Valid Cases    | 100   |                      |

Table 11 B: Chi square test

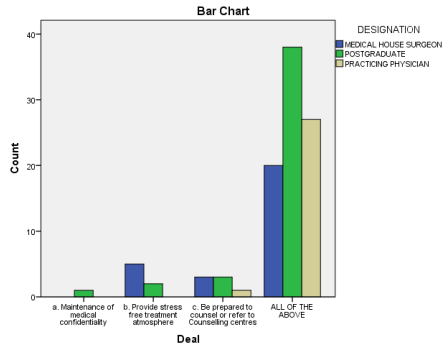


Fig 11: Dealing with HIV patient

Crosstabulation

| Count   | DESIGNATION           |              |                      | Total |
|---------|-----------------------|--------------|----------------------|-------|
|         | MEDICAL HOUSE SURGEON | POSTGRADUATE | PRACTICING PHYSICIAN |       |
| .00     | 20                    | 34           | 20                   | 74    |
| 1.00    | 0                     | 2            | 0                    | 2     |
| 2.00    | 4                     | 1            | 2                    | 7     |
| 3.00    | 0                     | 2            | 2                    | 4     |
| 4.00    | 2                     | 0            | 2                    | 4     |
| No.Oral | 0                     | 0            | 1                    | 1     |
| 6.00    | 1                     | 0            | 0                    | 1     |
| 7.00    | 0                     | 1            | 0                    | 1     |
| 9.00    | 1                     | 0            | 0                    | 1     |
| 10.00   | 0                     | 4            | 0                    | 4     |
| 12.00   | 0                     | 0            | 1                    | 1     |
| Total   | 28                    | 44           | 28                   | 100   |

Table 12 :Number of oral lesions seen

Crosstab

|       |                      | DESIGNATION           |              |                      | Total  |        |
|-------|----------------------|-----------------------|--------------|----------------------|--------|--------|
|       |                      | MEDICAL HOUSE SURGEON | POSTGRADUATE | PRACTICING PHYSICIAN |        |        |
| HAART | NO                   | Count                 | 11           | 30                   | 18     | 59     |
|       |                      | % within HAART        | 18.6%        | 50.8%                | 30.5%  | 100.0% |
|       |                      | % within DESIGNATION  | 39.3%        | 68.2%                | 64.3%  | 59.0%  |
|       | YES                  | Count                 | 17           | 14                   | 10     | 41     |
|       |                      | % within HAART        | 41.5%        | 34.1%                | 24.4%  | 100.0% |
|       |                      | % within DESIGNATION  | 60.7%        | 31.8%                | 35.7%  | 41.0%  |
| Total | Count                | 28                    | 44           | 28                   | 100    |        |
|       | % within HAART       | 28.0%                 | 44.0%        | 28.0%                | 100.0% |        |
|       | % within DESIGNATION | 100.0%                | 100.0%       | 100.0%               | 100.0% |        |

Table 13 A1 :Only HAART as treatment

Verghese R. *et al.*. Int J Dent Health Sci 2014; 1(5):748-770  
**Chi-Square Tests**

|                     | Value | Exact Sig. (2-sided) |
|---------------------|-------|----------------------|
| Fisher's Exact Test | 6.182 | .052                 |
| N of Valid Cases    | 100   |                      |

Table 13 A2 : Chi square tests

**Crosstab**

|                    |                      |                      | DESIGNATION           |              |                      | Total  |
|--------------------|----------------------|----------------------|-----------------------|--------------|----------------------|--------|
|                    |                      |                      | MEDICAL HOUSE SURGEON | POSTGRADUATE | PRACTICING PHYSICIAN |        |
| INDIVIDUAL LESIONS | NO                   | Count                | 25                    | 40           | 26                   | 91     |
|                    |                      | % within INDIVID     | 27.5%                 | 44.0%        | 28.6%                | 100.0% |
|                    |                      | % within DESIGNATION | 89.3%                 | 90.9%        | 92.9%                | 91.0%  |
|                    | YES                  | Count                | 3                     | 4            | 2                    | 9      |
|                    |                      | % within INDIVID     | 33.3%                 | 44.4%        | 22.2%                | 100.0% |
|                    |                      | % within DESIGNATION | 10.7%                 | 9.1%         | 7.1%                 | 9.0%   |
| Total              | Count                | 28                   | 44                    | 28           | 100                  |        |
|                    | % within INDIVID     | 28.0%                | 44.0%                 | 28.0%        | 100.0%               |        |
|                    | % within DESIGNATION | 100.0%               | 100.0%                | 100.0%       | 100.0%               |        |

Table 13 B1 : Only treatment of Individual lesions

**Chi-Square Tests**

|                     | Value | Exact Sig. (2-sided) |
|---------------------|-------|----------------------|
| Fisher's Exact Test | .338  | 1.000                |
| N of Valid Cases    | 100   |                      |

**Crosstab**

|       |                      |                      | DESIGNATION           |              |                      | Total  |
|-------|----------------------|----------------------|-----------------------|--------------|----------------------|--------|
|       |                      |                      | MEDICAL HOUSE SURGEON | POSTGRADUATE | PRACTICING PHYSICIAN |        |
| BOTH  | NO                   | Count                | 20                    | 22           | 10                   | 52     |
|       |                      | % within BOTH        | 38.5%                 | 42.3%        | 19.2%                | 100.0% |
|       |                      | % within DESIGNATION | 71.4%                 | 50.0%        | 35.7%                | 52.0%  |
|       | YES                  | Count                | 8                     | 22           | 18                   | 48     |
|       |                      | % within BOTH        | 16.7%                 | 45.8%        | 37.5%                | 100.0% |
|       |                      | % within DESIGNATION | 28.6%                 | 50.0%        | 64.3%                | 48.0%  |
| Total | Count                | 28                   | 44                    | 28           | 100                  |        |
|       | % within BOTH        | 28.0%                | 44.0%                 | 28.0%        | 100.0%               |        |
|       | % within DESIGNATION | 100.0%               | 100.0%                | 100.0%       | 100.0%               |        |

Table 13 C1: Both HAART and treatment of individual lesions

**Chi-Square Tests**

|                     | Value | Exact Sig. (2-sided) |
|---------------------|-------|----------------------|
| Fisher's Exact Test | 7.237 | <b>.028</b>          |
| N of Valid Cases    | 100   |                      |

Table 13 C2 :Chi square tests

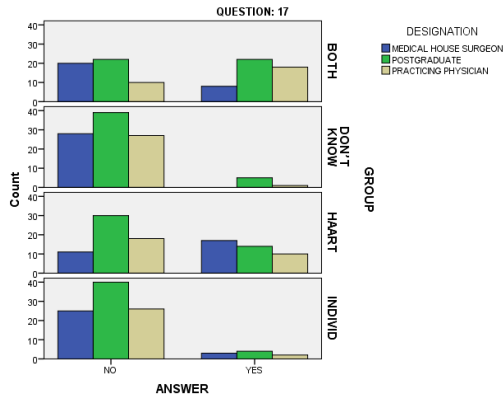


Fig 13 :Management of HIV patients with oral lesions

**Crosstab**

|         |                      | DESIGNATION           |              |                      | Total  |
|---------|----------------------|-----------------------|--------------|----------------------|--------|
|         |                      | MEDICAL HOUSE SURGEON | POSTGRADUATE | PRACTICING PHYSICIAN |        |
| SEMINAR | Count                | 11                    | 9            | 15                   | 35     |
|         | YES                  | 31.4%                 | 25.7%        | 42.9%                | 100.0% |
|         | % within DESIGNATION | 39.3%                 | 20.5%        | 53.6%                | 35.0%  |
|         | Count                | 15                    | 27           | 13                   | 55     |
|         | NO                   | 27.3%                 | 49.1%        | 23.6%                | 100.0% |
|         | % within DESIGNATION | 53.6%                 | 61.4%        | 46.4%                | 55.0%  |
| NEVER   | Count                | 2                     | 8            | 0                    | 10     |
|         | % within SEMINAR     | 20.0%                 | 80.0%        | 0.0%                 | 100.0% |
|         | % within DESIGNATION | 7.1%                  | 18.2%        | 0.0%                 | 10.0%  |
| Total   | Count                | 28                    | 44           | 28                   | 100    |
|         | % within SEMINAR     | 28.0%                 | 44.0%        | 28.0%                | 100.0% |
|         | % within DESIGNATION | 100.0%                | 100.0%       | 100.0%               | 100.0% |

Table 14 A: Seminars/Workshops attended recently

**Chi-Square Tests**

|                     | Value  | Exact Sig. (2-sided) |
|---------------------|--------|----------------------|
| Fisher's Exact Test | 12.032 | .013                 |
| N of Valid Cases    | 100    |                      |

Table 14B: Chi square tests

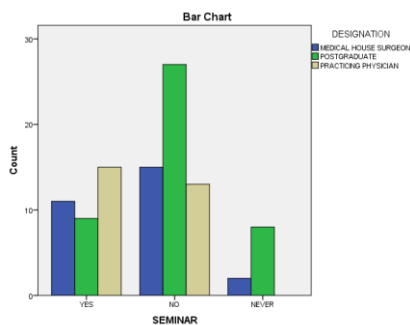


Fig14 :Seminars/Workshops attended recently