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Impact of COVID-19 on profession and psychology of dental health professionals-A questionnaire based Pan India survey

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Abstract

The complete medical fraternity has faced the wrath of the COVID-19 outbreak. The aim of this study was to evaluate the impact of this outbreak on dental surgeons across India and how the situation was being tackled. A questionnaire was formulated, posted on the internet and circulated amongst dental surgeons. It was targeted at Dental Professionals, aiming to assess the protocols adapted in their practice, the difficulties faced; it's impact on them. The current scenario has affected the Dental Health Care Professionals(DHCP) personally, professionally, financially and psychologically. In contrast to the adversities faced, some have used the lockdown to their benefit. It was concluded that the guidelines issued

by various health organisations were followed by most of the participants. The results highlight the need for taking measures regarding uniform implementation of protocols and ensuring well being of DHCPs. Also this might help us in preparing for such future pandemics.

Keywords: COVID 19, Dental Health Services, Protective Clothing, Dental Clinics, Clinical Protocols, Infection, Cross-Infection, Severe Acute Respiratory Syndrome (SARS)

Introduction

In December 2019, there was an outbreak of pneumonia of an unknown etiology reported in Wuhan, Hubei Province, China[1]. Following the outbreak, a strain of Corona virus, SARS-CoV-2, was identified as the causative agent for the epidemic in China[2,3], now a viral pandemic encompassing more than 227 countries and territories affecting more than 41 million people and causing about 1 million deaths till date. The WHO declared COVID-19, a global health concern on January 31, 2020, causing severe respiratory tract infections in humans. The pathogen that causes COVID-19 is a Novel Corona Virus(2019-nCoV) that was first identified in late January 2020 and named as SARS-CoV-2[2,3].Current evidence indicates that SARS-CoV-2 spread to humans via transmission from wild animals illegally sold in the Huanan Seafood Wholesale Market ,Wuhan [4]. Phylogenetic analysis shows that SARS-CoV-2 is a new member of the Coronaviridae family but is distinct from SARS-CoV (approximately 79% identical) and MERS-CoV (approximately 50% identical)[2,3].

The major route of transmission is droplet and close contact[5,6]. Whether infection can occur through the oral or conjunctival routes is unknown, but SARS-CoV-2 has been detected in tears, which resembles SARS-CoV[7].

The first case of COVID-19 in India was reported on 30 January, 2020[8]. Till date India has reported 1,07,20,048 confirmed cases with 1,54,010 deaths[9]. On 24 March, 2020; Government of India announced a 21 days Nationwide Phase 1 lockdown. Later lockdown was extended to Phase 2, followed by Phase 3 and Phase 4. On 30 May, 2020 Government of India announced continuation of lockdown in containment zones and the lifting of the restrictions in phases in non- containment zones[10].

India currently has the largest number of confirmed cases in Asia[11], and is the second highest in the world after the United States.

Facing this critical situation, health care workers on the front line are at risk of developing psychological distress and other mental health symptoms[12]. The ever-increasing number of confirmed and suspected cases, overwhelming workload, depletion of personal protection equipment, widespread media coverage, lack of specific drugs, and feelings of being inadequately supported may all contribute to the mental burden of these health care workers[13]. Studies showed that health care workers feared contagion and infection of their kin, felt uncertainty and stigmatization, reported reluctance to work, and reported experiencing high levels of stress, anxiety, and depression symptoms[14,15].

The World Health Organization (WHO) and other national and international public health authorities recommend implementing safety protocols for healthcare workers[16,17]. Precautions to be implemented by healthcare workers (HCW) attending patients with COVID-19 include using appropriate personal protective equipment (PPE).

The current situation has a high risk of cross-infection amongst the dental surgeons and the patient undergoing dental treatments[18]. Most dental procedures require close contact with the patient's oral cavity, saliva, blood and respiratory tract secretions. Saliva is rich in COVID-

19 viral load[19]. Aerosols (<5µm) or droplet nuclei generated during most of the dental procedures puts dentistry at the cusp of community transmission. The virus has been known to survive in aerosols for hours and on surfaces for days. This puts a lot of responsibility on dentists and their staff to accordingly modify the practices followed to prevent cross infection.

According to the guidelines, dental clinics remained closed in the containment zones, while in the other zones only emergency and urgent dental care is being given. All elective and routine procedures have been deferred until further guidelines are issued. Tele-health strategies continue to provide high quality patient care and reduce the risk of virus transmission in healthcare settings.

This pandemic has been taxing for the dental surgeons in different ways including physically, psychologically and financially. During the initial advent of the disease there was complete shutdown for some while others struggled to cope up with the updates and protocols to be followed. The dilemma about the type of PPE, its usage, masks, sterilization protocols, air quality enhancers and other modifications to be brought in practice prevailed. Despite regular online webinars, videos and sessions that aided in updating the knowledge on the subject, a lot of confusion prevailed. Information from multiple unauthorized sources created a misleading web of facts. The upgrade of equipment and the diminished number of patients have led to reduced income of the dental professionals and staff at the clinics. Even after reopening of the clinics & the OPD and investing on the equipment the in-flow of the patients is scarce, further adding up to the financial crisis. Along with the financial issues, there is a major impact on mental health leading to stress, anxiety and depression amongst them. This psychological distress is augmented by shutting down of practice, increased free time, difficult working conditions and circulating myths about the disease. The silver lining of the situation is being able to get time for upgrading of knowledge, learning new skills and getting ample family time. With the pandemic still on the climbing growth curve, there is no hope of revival anytime soon.

So, this study aims to ascertain the challenges faced by dental professionals due to COVID-19 and the lockdown imposed for the same, through a questionnaire-based assessment.

Methodology

A closed-ended 34-points questionnaire was prepared to understand the impact of COVID-19 on the profession and psychology of Dental Surgeons. The survey reviewed by Institutional Review Ethical Board and given protocol number IREB/2020/OS/09. A self-administered questionnaire was prepared on Google sheets and circulated to dental practitioners across India through different social media portals. Only Dental Practitioners in dental practice who completed the entire questionnaire were included for the study. A pilot study was conducted on 50, subjected prior to the study to test and validated the questionnaire before finalizing the same. The subjects of the pilot were considered in the final study. Finally, 810 responses were considered from a period of 1 month (15 April, 2020- 16 May, 2020).

All the data was entered and analyzed using package SPSS, version 25.0. Descriptive statistics of the variables and variations were procured.

Result

Respondent's Profile: The results were obtained through a questionnaire based survey. The survey was filled up by a total of 810 participants among which the percentage of female and male participants was 42.8% and 57.2% respectively. The composition of age groups was: below 30 years(30.7%), 30-55years(65.3%), 56-65years(2.8%) and above 65years(1.1%). The qualifications of the

respondents were BDS(45.7%) and MDS(54.3%). The respondents that participated in the survey were practicing in various zones of India: North(23.1%), West(30%), East(13.8%), South(17.9%) and Central zone(15.2%). The participants were working in different setups like Government Hospitals(8.6%), Private Hospitals(28.6%), Private Clinics(58.4%) and others(4.4%).

Respondent's Practice and Patients: 56.2% of the participants were attending patients out of which 92.5% were doing emergency procedures while only 7.5% were doing all regular procedures, whereas 43.8% were not attending any patients during the lockdown. Out of the total respondents 88.6% were practicing telephonic consultation, 77.2% of which were for emergency treatment while 22.8% were for regular appointments. 64.6% of the respondents wanted to re-open their practice for all clinical procedures. The number of patients visiting per day were less 5(74%), 5-10(21.5%) and more than 10(4.5%). Only 39.6% of the respondents claimed that there patients were willingly paying for PPE.

Protective Gear and Protocols against Covid-19 Used by Respondents: 86.8% of the participants were using PPE for procedures during lockdown, and 50.9% of participants were finding difficulty in getting supply of PPE. The protective gear used by them were: Eyewear(84.6%), Face-shields(95.3%), Disposable gowns(65.8%), Autoclavable gowns(28.8%), Surgical masks(23.1%), N-95 respirators(77.5%), Single sterile gloves(39.5%), Double sterile gloves(60.5%), Headcaps(89.5%) and Shoecovers(67.3%) (Figure 1). 80% of the respondents reused N-95 masks of which 19.3% use ethanol spray, 36.9% dry heat, 22.2% ultraviolet light, 3.1% vaporized hydrogen peroxide and 18.5% using none of these methods (Figure 2).

Out of the participants using PPE, the thickness of the PPE varied, it was 60gsm(9%), 70gsm(11.9%), 80gsm(18.8%), 90gsm and above(49.4%). 23.1% of the participants are not familiar with the proper donning and doffing techniques.

87.4% of the respondents adopted the protocols issued by the Health Ministry of India/ Dental Council of India for dental clinics.

Disinfection Protocol Followed By The Respondents: 56.8% of the participants sterilized the working area after every patient, 7.7% every 4 hourly, 28.8% once daily; with chlorine dioxide/H2O2 vapours(27.4%), HEPA filters(23.2%), Natural ventilation(36.3%), negative pressure room(4.7%) and ultraviolet germicidal irradiation(8.4%) (Figure 3).

Difficulties Faced By The Respondents: 58.6% of the respondents faced difficulty in getting the lab work done and 47.8% had no availability of dental assistant.

69.3% of the participants faced financial constraints during the lockdown with their major concerns being EMI(39%), rent of the clinic(27.3%), rent of the house(10.7%) and house expenditure(44.7%) (Figure 4).

77.8% of the participants had no insurance cover against COVID-19, 0.2% had only for dental clinic, 12% for themselves, 3.5% for themselves and their assistants and 6.5 % had for all the before-mentioned.

58% participants felt low in spirit during the lockdown and 20.2 % of the total wanted to change their profession.

Usage of Quarantine Time: 64.3% of the participants were willing to assist in clinical care of COVID-19 patients. 95.9% of them used lockdown period productively by upgrading themselves and enhancing their knowledge or skill. Online webinars were attended by the participants, less than 10 webinars(50%), 10-20 webinars(28.8%), 21-30 webinar(10.1%) and more than 30(11.1%). Lockdown was advantageous in giving good quality family time to 93.1% of the participants.

Discussion

Doctors have been under tremendous physical and mental strain in times of COVID-19. Hospitals are facing the challenge of demand exceeding supply, coupled with staff infection. We have seen incredible dedication, great leadership and true bravery of healthcare professionals working long hours, sometimes even without adequate PPE during this viral pandemic.

Dental professionals appear at high risk of contagion due to the exposure to saliva, blood and aerosols during majority of procedures[20]. The high risk of professional contagiousness[21] and lockdown forced many private dental practices to shut down completely, while the proportion of practitioners that continued seeing patients were mostly doing emergency procedures only. Elective procedures being done were minimal. More than half of the respondents wanted to reopen their practice for all procedures.

The practitioners adopted many protocols to minimize their community spread like pre-appointment tele-triage[22], tele-therapy, minimizing the number of appointments, pre- treatment mouth rinses[23], strict hand hygiene, use of PPE, limited aerosol generating procedures, good de-contamination and disinfection[20]. Life threatening dental cases like space infections and maxillofacial trauma were admitted to the hospital, and a chest x-ray or HRCT of the chest if available was taken to exclude suspected infection because RT-PCR reporting took time in the processing [21].

Tele-health has reached widespread adoption due to reduced risk of exposure. Most of our respondents were practicing tele-health for regular consultation. WHO mentioned that tele-health amongst essential services has aided in strengthening the health system response to the pandemic[20]. Patients also avoided appointments as much as possible unless very urgent due to risk of exposure and increased treatment costs.

Many organizations have been providing guidelines from the beginning of the pandemic for healthcare workers and dental professionals like ADA[24], OSHA[25], CDC[26], ICMR[27],WHO[28]

OSHA recommends use of PPE when providing dental treatment to patients during COVID-19 pandemic. Clothing, such as scrubs, lab coats and/or smocks or a gown, Gloves, Eye protection (e.g. Goggles, face shield), Face masks (e.g. Surgical mask) are recommended for non aerosol-generating procedures; while NIOSH-certified disposable N95 or higher filtration capacity face-piece respirator to be used for aerosol generating procedures and suspected or confirmed COVID 19 patients[25].

As per CDC, DHCP should wear a face mask at all times, surgical masks or respirators preferred. An N-95 mask should be worn when seeing patients while a normal 3ply surgical mask can be worn in-between the appointments. Respirators with exhalation valves are not currently recommended, as they allow unfiltered exhaled air to escape. During procedures; N-95, eye protection (goggles or face-shield), a gown and sterile gloves should be worn[22].

Most of our respondents have been using PPE according to the guidelines for procedures though some faced scarce supply and difficulty in availability. Although they were using 90 gsm or higher gowns and coveralls but no such specification is provided by health organizations. So, the dilemma still persists. Also, a small percentage of respondents were not familiar with the guidelines on donning and doffing of PPE.

N-95 masks were being used by maximum number of respondents that were seeing patients. The performance of N-95 Face-piece respirator (FFR) decreases as the number of hours and number of donning-doffing increase.

According to CDC, decontamination and reuse of FFRs are not consistent with standard and approved usage, but it may be considered when FFR shortages exist. A regular N-95 mask can undergo approximately 4 - 5 decontamination cycles, with chlorine dioxide being the most commonly used[22]. Using alcohol solutions and chlorine based solutions decreases the efficacy of the N-95 masks to 56.33% and 73.11% respectively[29] . Dry heat was the most commonly used method used by our respondents for reuse of masks. Dry heat is accomplished by conduction, a temperature of 160-170° must be achieved for the entire item. It causes destruction of microorganisms by denaturation of proteins. Natural air drying of masks in dry paper bags with intermittent usage at intervals on the 5th day was also used[30]. Hot air (oven), vaporized hydrogen peroxide and UV sterilization are the most recommended methods for N-95 masks[29].

The recommendation of 0.1% of hypochlorite based products (4-6% sodium hypochlorite solution) will inactivate the vast majority of pathogens present in a health care setting. In indoor spaces, spraying, fogging, fumigation or misting is not recommended for COVID-19. Spraying as a primary disinfection strategy is ineffective in removing contaminants outside of direct spray zone and moreover it can result in adverse health defects of workers in the facility. Also these techniques may not be effective in removing organic material and may miss surfaces shielded by objects, folded fabrics or surfaces with intricate designs. Even use of UV irradiation may supplement but they cannot replace manual cleaning procedures. All health-care settings must be cleaned and disinfected twice daily (minimum)[28]. HEPA filters in clinic set ups are recommended as by European standard and ASME with an approximate filtration of 99.95% of particles less than and greater than 0.3µm. According to CDC, fogging with chemicals such as formaldehyde, phenol based agents, or quaternary ammonium compounds is not recommended as a way to decontaminate environmental surfaces due to reporting of lack of microbial efficacy and also adverse effects on health care workers. However, fogging with newer agents such as ozone mists and vaporized hydrogen peroxide is still under research for its efficacy and reliability[26]. Our respondents were mostly disinfecting their workplace after each patient but no domination was seen for any of the methods of disinfection.

In addition to this, difficulty was faced in getting lab work done by the respondents due to shutdown of dental labs and non-availability of lab-technicians. Also, there was a generalized decrease in availability of dental assistants during the lockdown.

Along with this it was also seen that there was increasing levels of psychological stress among the respondents. This may be due to disturbed work practice or the risk of taking the virus back to loved ones and family. Use of stress and anxiety helplines and counselings should be encouraged to cope up with the same.

According to a report by Indian Medical Association on 16th September, 2020; 382 doctors registered under them have died of COVID-19. Also, due to such close contact with the body fluids, a large number of dental professionals are being tested positive.

The dual effect of rising costs due to up-gradation of equipment's and falling revenues have added to the burden of the dental professionals, threatening their financial sustainability hence most of the respondents faced financial constraints during lockdown. Also, almost half of them claimed that the patients were not willing to pay for PPE. Maximum number of respondents had no insurance coverage against COVID-19 for themselves, their families, clinics and clinical staff. The uncertainty, insecurity and difficulties faced by the dental

professionals have even led to the point where they wanted to change their profession.

However on the bright side, the lockdown had given ample time for upgrading and enhancing skills and knowledge. Regular online webinars and sessions have been a boon for the students and professionals keen on learning. The accessibility to lectures and conferences has increased due to its online availability reducing the hustle of travelling. In addition to all this, lockdown has given time out of our busy schedules to reconnect with family and spend quality family time. Our respondents have mostly been attending these webinars and utilizing the lockdown time as a boon.

Conclusion

There has been a lot of perplexity amongst dental health professionals regarding the selection of PPE, its usage and safety protocols for clinic. Also, we need to come up with more operator friendly measures, keeping in mind the discomfort and long clinical durations. Adding to this, is the impact on their social, psychological and financial status. With prevailing atrocities like limited manpower and resources, high operational cost and continuous risk of infection, it will be a challenge to handle the pent up demand for treatment delayed during lockdown. The focus of our treatment should change from being only clinical based to being clinical with an epidemiologic base. The road to recovery is a long one, COVID-19 is here to stay for some time. So, adaptations have to be made to the current scenario and resumption of the normal practices has to be done adapting to the new normal, keeping in mind patient and self-safety. The measures need to be pivoted towards encouraging financial and psychological wellbeing of DHCPs, so that the impact is not reflected on individual levels and in the clinical practices.

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Legend Figures

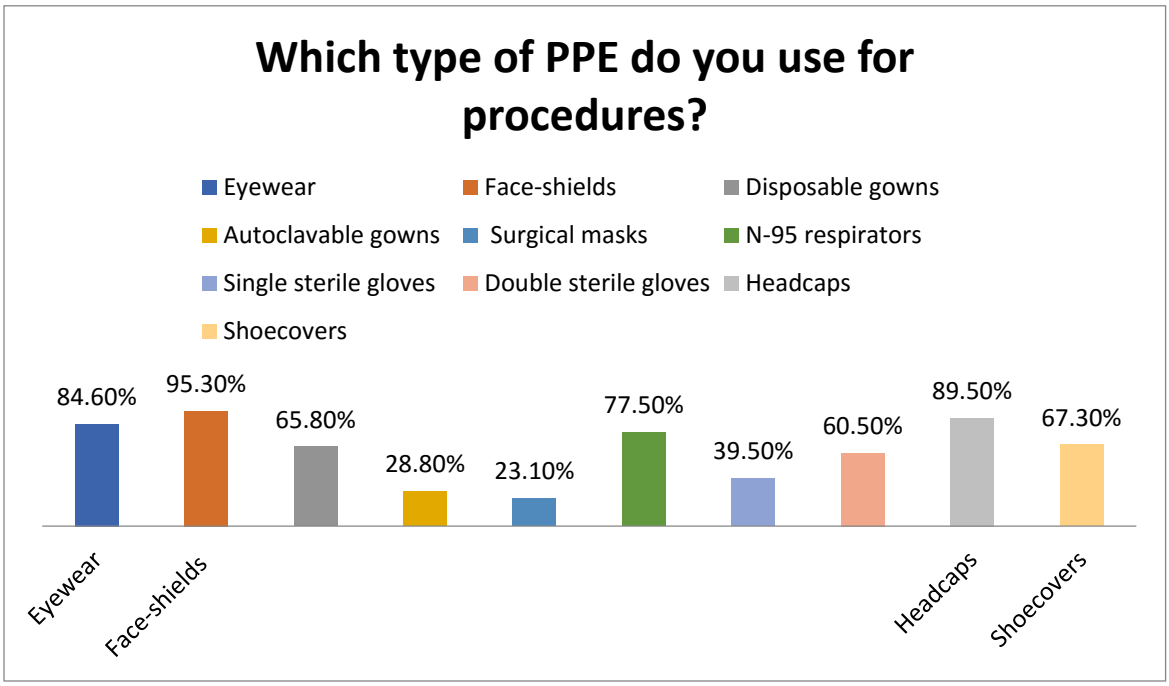

Figure 1: Types of PPE used for procedure.

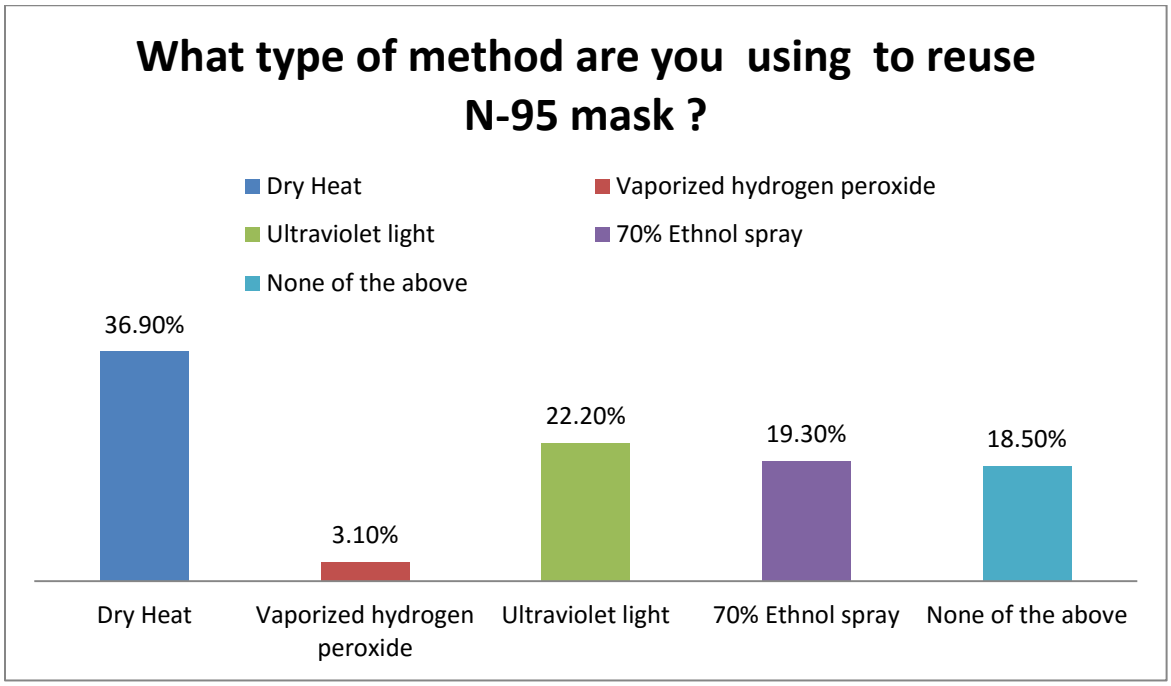

Figure 2: Different Type of methods used to re-use N-95 mask.

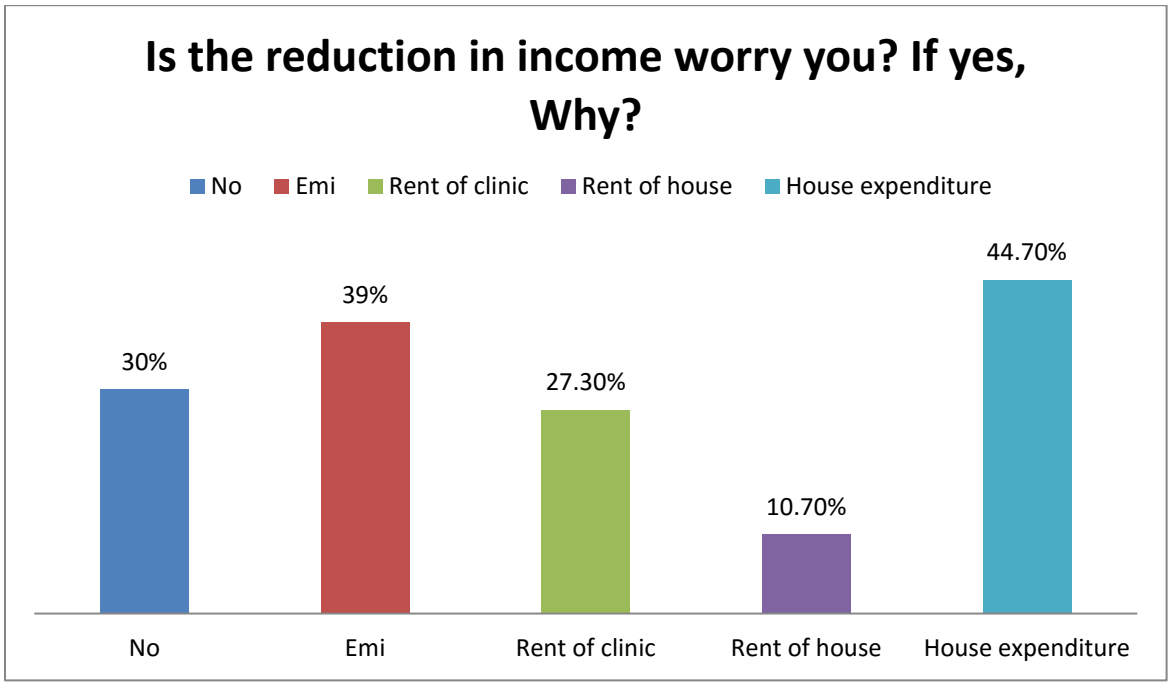

Figure 3: Reasons of psychological impact due to reduction in income.