



Survey on HBV Immunisation Status among the Dental Practitioners

R. N. Arun Kishore¹ and N. P. Muralidharan^{2*}

¹Saveetha Dental College, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai-600077, India.

²Department of Microbiology, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Science, Saveetha University, Chennai-600077, India.

Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JPRI/2021/v33i47B33139

Editor(s):

(1) Dr. R. Deveswaran, M.S. Ramaiah University of Applied Sciences, India.

Reviewers:

(1) Roshini Sathiaselvan, University of Oklahoma Health Sciences Center, USA.

(2) Irfan Şencan, Health Science University, Turkey.

(3) Abeer Samir Mohammed Yamany, Zagazig University, Egypt.

Complete Peer review History: <https://www.sdiarticle4.com/review-history/74455>

Received 05 August 2021

Accepted 11 October 2021

Published 03 November 2021

Original Research Article

ABSTRACT

Introduction: There are more than 2 billion people worldwide who have evident recent or past HBV infection and chronic cases. Hepatitis B, C and D are transmitted by parental contact with infected body fluids including blood, semen, saliva, sweat and tears, invasive medical procedures using equipment which are contaminated with the virus, vertical transmission. Hepatitis B vaccine is a vaccine that prevents hepatitis B. The first dose is recommended within 24 hours of birth with either two or three more doses given after that. This includes those with immunisation such as from AIDS/HIV and those born premature. It is also recommended that health-care workers be vaccinated. In healthy people routine immunisation results in more than 96% of the people being protected.

Aim: The aim of this study is to know the immunisation status and knowledge and awareness among dental practitioners.

Materials and Methods: A survey was designed to analyse the result. The questionnaire was prepared in Google Forms (online survey link) and was distributed to 100 dental practitioners. The responses were then collected and statistically analysed using SPSS software.

Results and Discussion: After discussing the results of the present study, it was seen that many were aware of hepatitis B vaccine. Limitations of this are that the population is small. Limitations seen in this study can be included in future research for better spread of awareness among the general public.

Conclusion: From the study we can conclude that the majority of the dental practitioners are aware of hepatitis B vaccine and are aware of their vaccination status of hepatitis B.

Keywords: Hepatitis B; immunisation; transmission; vaccination.

1. INTRODUCTION

Hepatitis B (HBV) is caused by a double-stranded DNA virus of the hepadnaviridae. This virus will survive within the body for a minimum of seven days. Seven sorts of liver disease virus square measure known as infectious hepatitis clothe that F is theoretic and viral hepatitis remains the foremost serious sort with risk of death from liver–disease and cancer. measure billions of people worldwide and agencies have proof of recent or past HBV infection and chronic cases[1]. Viral hepatitis, C, and D are mainly transmitted by parental contact with infected body fluids together with blood, semen, saliva, sweat, and tears, invasive medical procedures and instrumentality that are contaminated with the virus[2], vertical transmission. Hepatitis-B vaccine, developed for the interference of hepatitis-B viral infection, could be a noncommunicable recombinant DNA vaccinum created from genetically designed yeast named brewer's yeast.

Although there has been modification within the production of the vaccine since its initial development in 1981, the entire vaccination still remains the uptake of the three-doses, with the second and third doses being given at one and six months intervals of the initial dose[3]. Despite the provision and recommendation on hepatitis-B vaccination, the vaccination rates among dental professionals have remained systematically low in developing countries. the explanations for the suboptimal hepatitis-B vaccination rates among physicians embrace lack of chance, lack of motivation, lack of knowledge, lack of awareness, non-availability, high price of the vaccinum, worry of facet effects, worry of being recognized as a hepatitis-B carrier, lack of perceived would like for the vaccinum, and error of non-susceptibility to the infection[4].There conjointly existed no accord regarding vaccination rates among dental professionals within the literature as dental surgeons had higher vaccination rates than dental auxiliaries in some studies whereas dental

auxiliaries had higher vaccination rates than dental surgeons in others[5].

Dental practice employees apart from clinical employees, like receptionists and managers, might need immunization if committed medical aid or sterilisation of apparatus and disposal of clinical waste. The immunity/carrier standing of employees are exposed and prone procedures are to be determined to shield patients against the danger of non inheritable viral hepatitis from an infected aid employee[6][7]. Access to an activity health service capable of providing recommendation and help in immunization and manufacturing applicable documentation would be beneficial, thus fulfilling the employers' obligations beneath health and safety legislation, furthermore as compliant with the new GDC registration procedures. Our team has extensive knowledge and research experience that has translate into high quality publications[8–32] The main aim of the study is to know the immunisation status and knowledge and awareness among dental practitioners.

2. MATERIALS AND METHODS

2.1 Study Design

A survey was conducted among dental undergraduates to evaluate their knowledge and awareness on the status of hepatitis B vaccination among dental practitioners. The sample size of the study was 100. The participants did the survey voluntarily and no incentives were given to them. The study was conducted in the month of, Feb, 2020.

2.2 Survey Instrument

The survey instrument which was a questionnaire was prepared after extensive review of the existing literature. The questionnaire was reviewed and amendments were made to improve clarity of the questions to eliminate ambiguous responses. The questionnaire consisted of a total of 11 questions. The questionnaire was shared to the dental practitioners.

2.3 Data Analysis

Only completed surveys were taken for analysis and the incompleted surveys were eliminated. The statistical test used is descriptive statistics.

All the responses obtained were tabulated and reliability of the data was checked. The statistics done using SPSS software, correlation test was done to check the association and *p* value of 0.05 was said to be statistically significant.

3. RESULTS

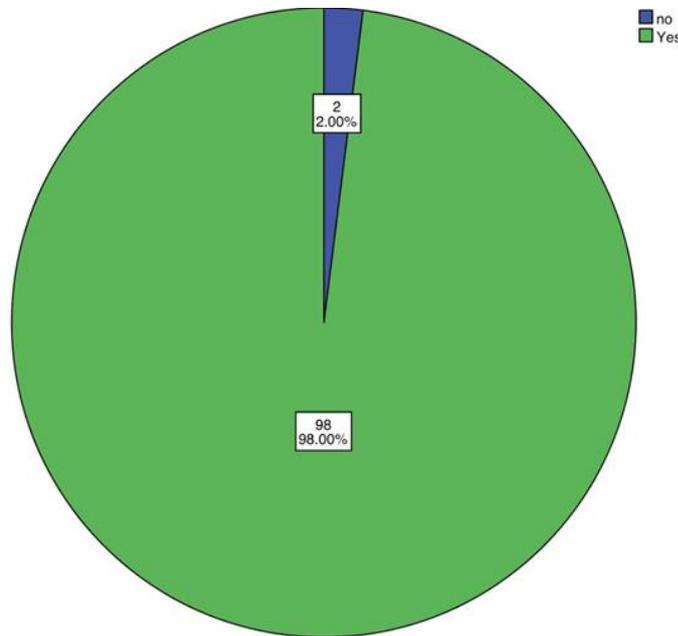


Fig. 1. The figure 1 depicts the population of participants who practice dentistry. 98.00% said yes (green) that they practice dentistry and 2% said no (blue) that they don't practice dentistry

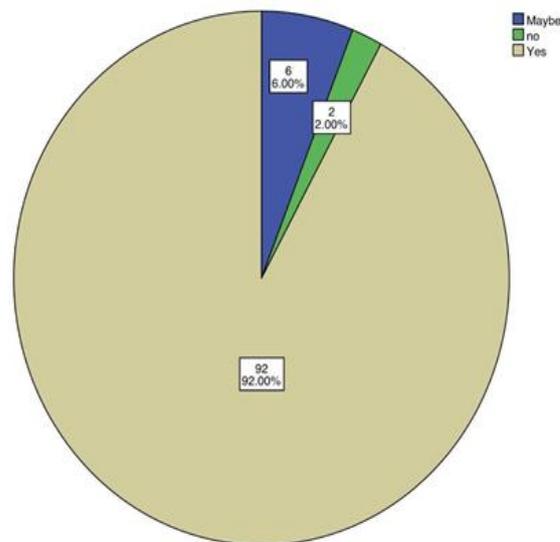


Fig. 2. This pie chart depicts the knowledge on the awareness of hepatitis B. 92.00% said yes (yellow) 2.00% said no and 6% said maybe

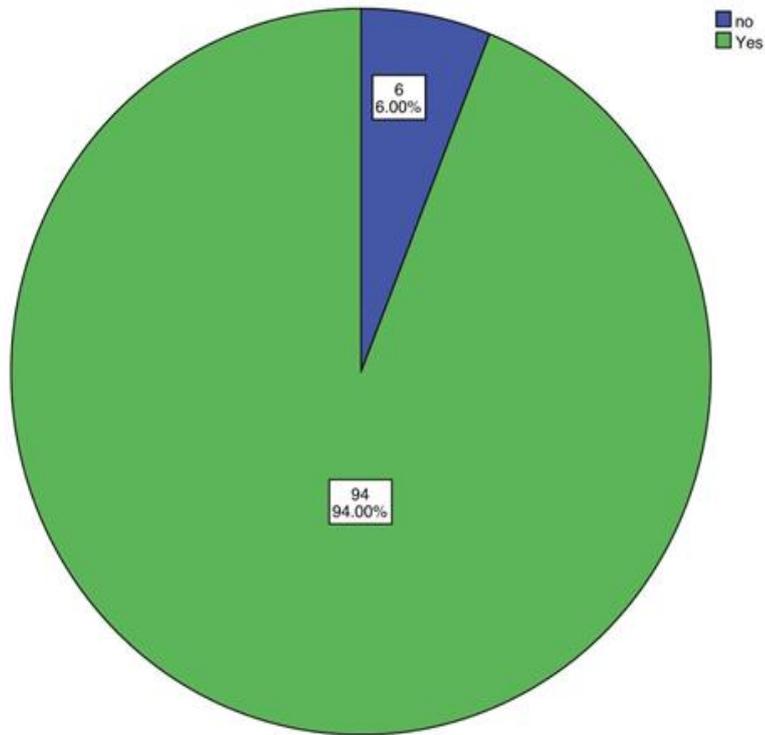


Fig 3. The pie chart depicts the knowledge among the participants regarding the vaccine available for hepatitis B. 94.00% said yes (green) and 6.00% said no (blue)

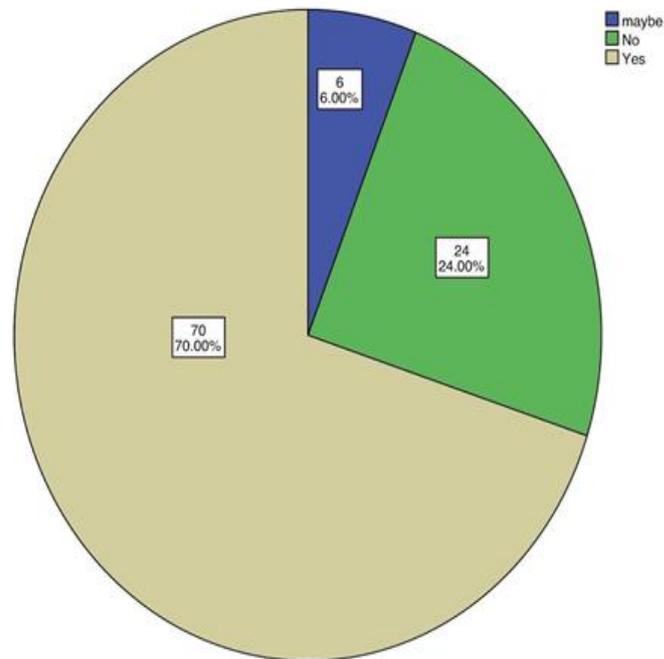


Fig. 4. The pie chart depicts the frequency of population of participants who have taken the hepatitis B vaccine. 70.00% said yes (yellow), 24.00% said no (green) and 6.00% said maybe

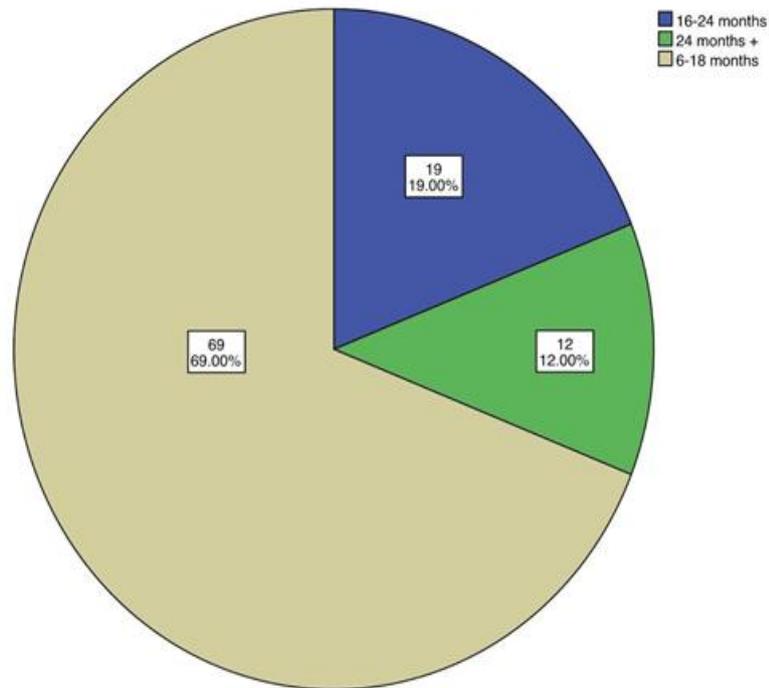


Fig. 5. The pie chart depicts the knowledge among participants on what age the vaccine will be given for hepatitis B. 69.00% said-6 -8 months (yellow), 12.00% said 24+ months (green) and 19.00% said 16- 24 months (blue)

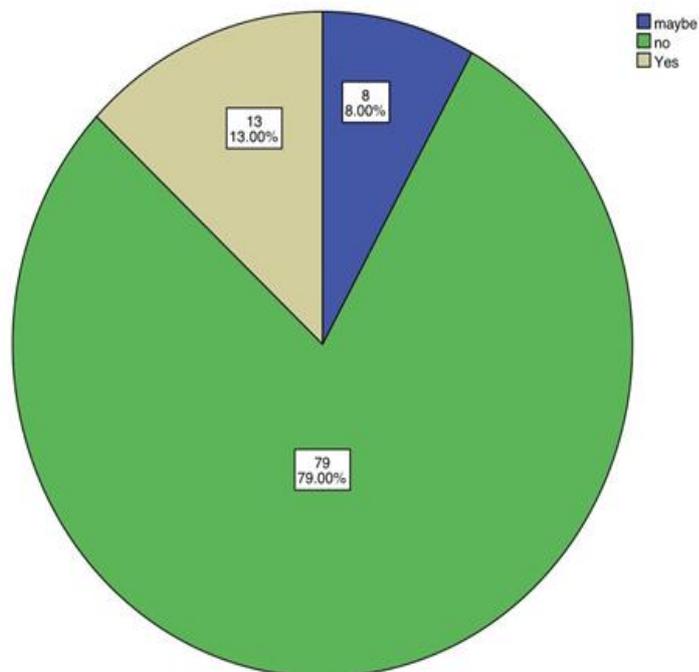


Fig. 6. The pie chart depicts the knowledge among the participants if they have taken the booster dose. 79.00% said no (green), 13.00% said yes (yellow), 8.00% maybe

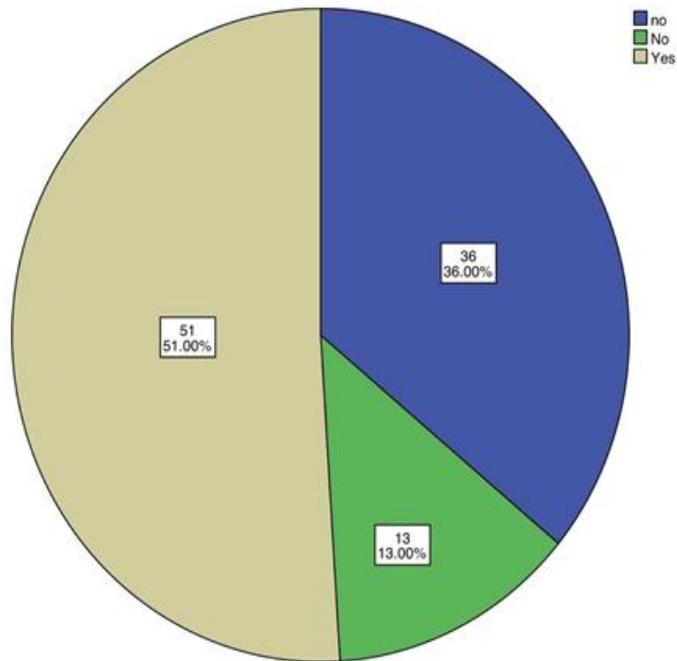


Fig. 7. The pie chart depicts the knowledge among the participants if they have checked for susceptibility for hepatitis B. 51.00% said yes (yellow), 36.00% said no (blue) and 13.00% said maybe (green)

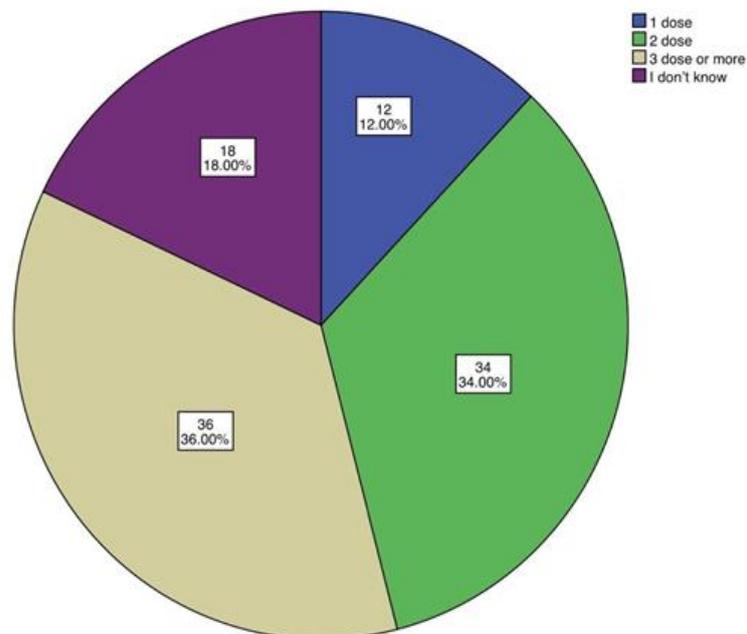


Fig. 8. The pie chart depicts the knowledge among the participants regarding the recommended full dose of hepatitis B vaccine.12.00% said 1 dose (blue), 34.00% said 2 doses (green), 36.00% said 3 dose and more (yellow), 18.00% said I don't know (purple)

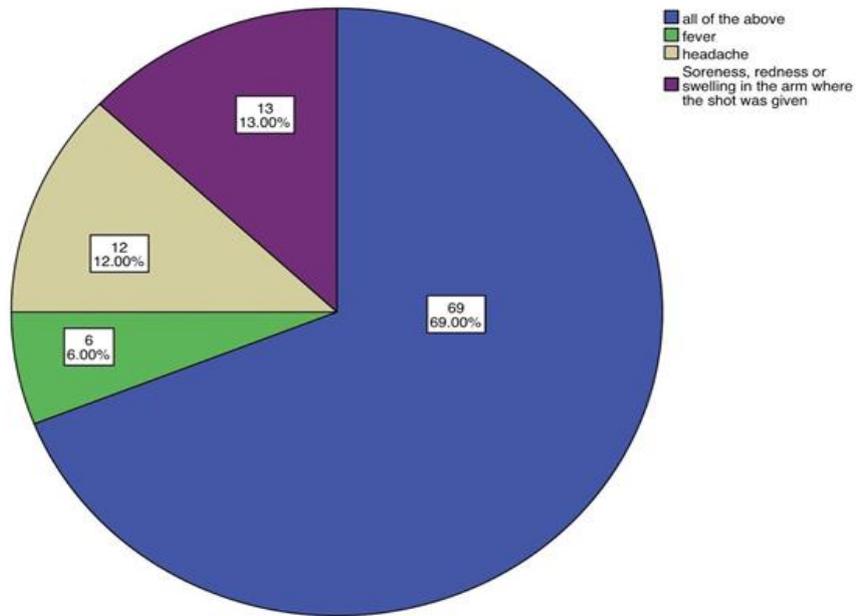


Fig. 9. The pie chart depicts the knowledge among the participants on the side effect of the hepatitis vaccine. 13.00% said soreness, swelling at the place of the shot (purple), 12.00% said headache (yellow), 6.00 said fever (green) and 69.00% said all of the above

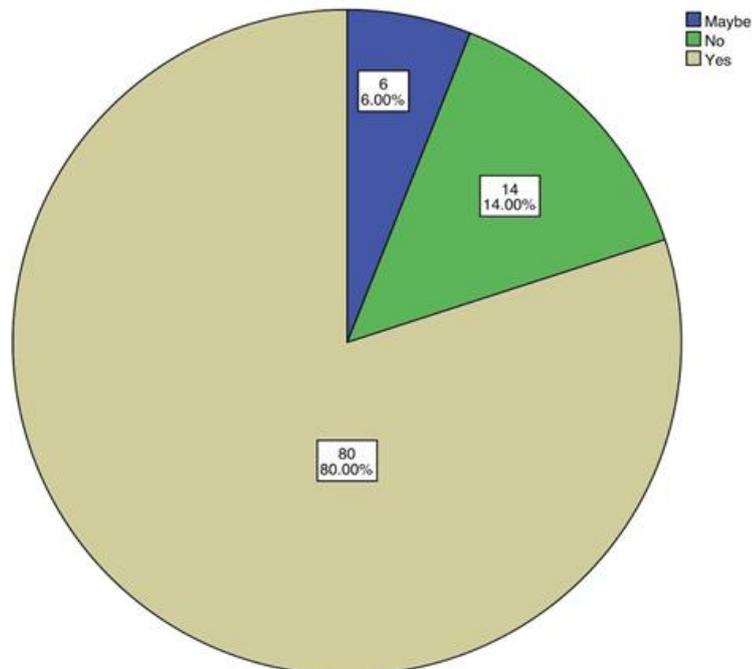


Fig. 10. The pie chart depicts the knowledge among the participants on transmission of hepatitis B through aerosol. 80.00% said yes (yellow), 14.00 said no (green) and 6.00% said maybe (blue)

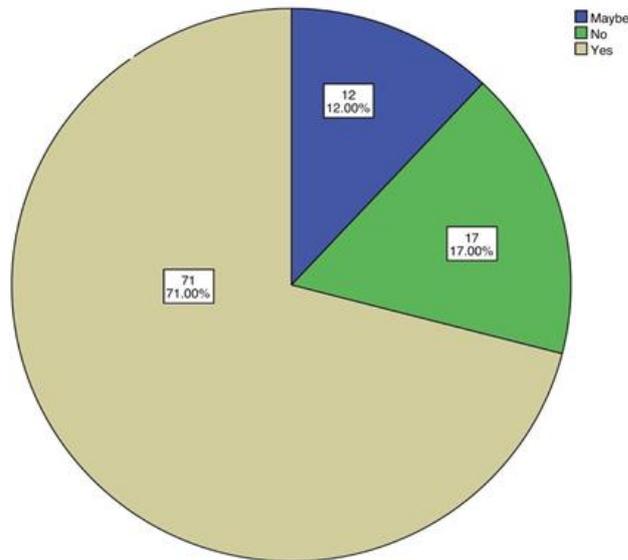


Fig. 11. The pie chart depicts the knowledge among the participants on transmission of hepatitis B through needle stick injury.71.00% said yes (yellow), 17.00% said no (green) and 12 .00% said maybe (blue)

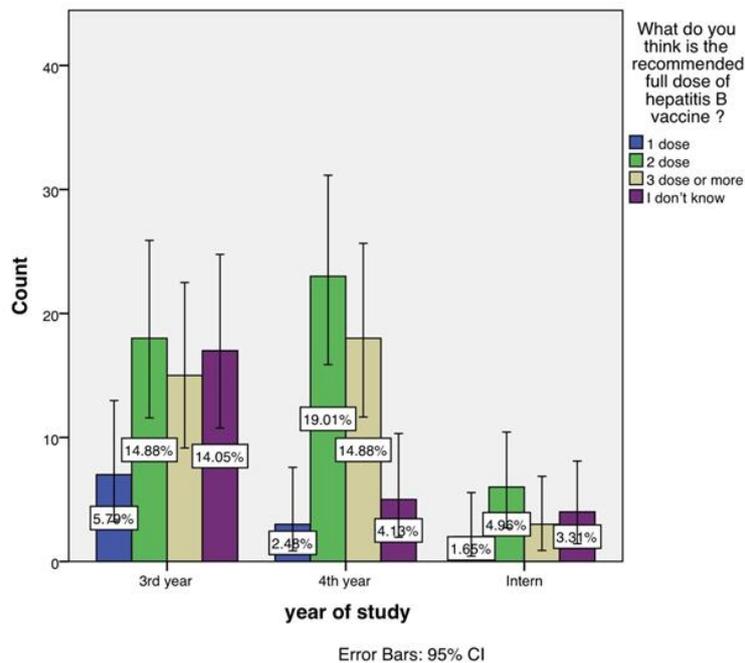


Fig. 12. Represents the association between the dental students on awareness of recommended full dose of hepatitis B vaccine and their year of study, where X axis represents the 'year of study' and the Y axis represents the 'number of responses'. Blue represents 1dose and green represents 2 doses, yellow represents 3 doses or more and purple represents that they don't know. The association showed p value of 0.026 <0.05 which was statistically significant (chi square test)

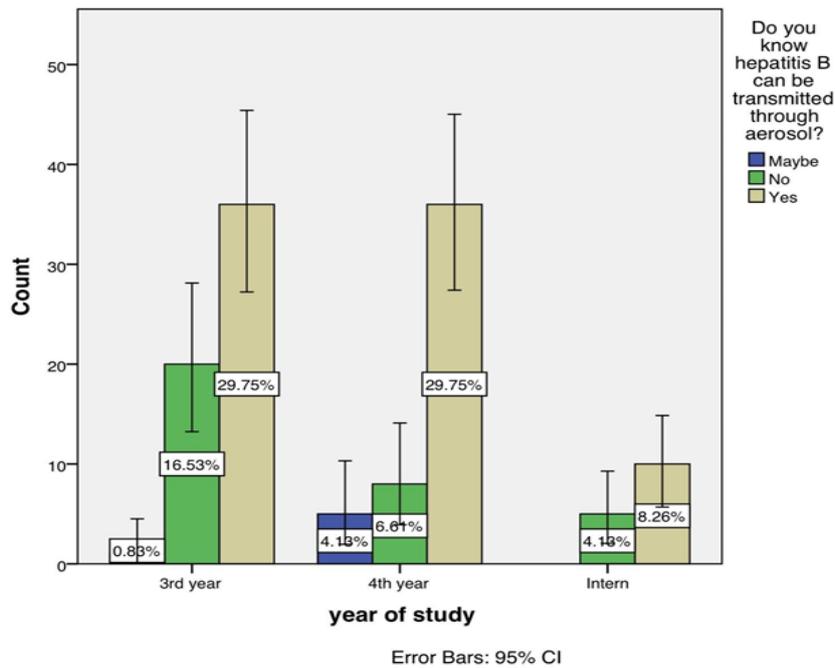


Fig. 13. Represents the association between the dental students on hepatitis transmission through aerosol and their year of study, where X axis represents the ‘year of study’ and the Y axis represents the ‘number of responses’. Blue represents maybe and green represents no and yellow represents yes. The association showed p value of $0.018 < 0.05$ which was statistically significant (chi square test)

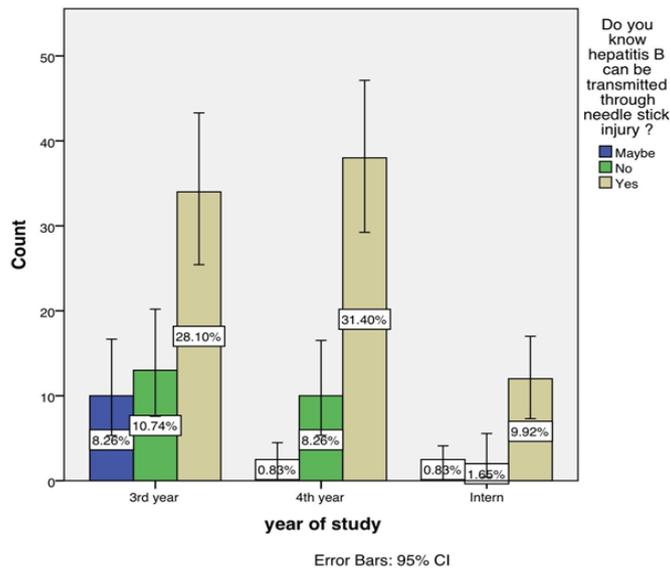


Fig. 14. Represents the association between the dental students exposed to needle stick injury transmission and their year of study, where X axis represents the ‘year of study’ and the Y axis represents the ‘number of responses’. Blue represents maybe and green represents no and yellow represents yes. Majority of 57% were not exposed to needle stick injury among them 50% were 3rd year students and 7% were final year students. The association showed p value of $0.026 < 0.05$ which was statistically significant (chi square test)

4. DISCUSSION

From the research survey done, the results were carefully statistically analysed and the results were tabulated using the SPSS software. The Fig. 1 depicts the population of participants who practice dentistry, of the participants majority of the participants that is 96.00% of the participants practice dentistry and the rest of the population that is 2.00% of the participants did not practice dentistry, so the responses of these participants were not included because they don't practice dentistry, their responses were excluded from the study. The Fig 2 depicts the awareness of the participants regarding hepatitis B virus, majority of the participants that is 92.00% said yes that they are aware of hepatitis B virus, 2.00% of the participants said no that they are not aware of hepatitis B and the rest of the participants that is 6.00% said they have no idea about hepatitis B virus. Fig. 3 depicts the knowledge among the participants regarding If vaccine is available for hepatitis B virus to which majority of the participants that is 94.00% of the participants said yes that they were aware of the vaccine available for hepatitis B virus and the rest of the population that is 6.00% said no that they are not aware of the vaccine that are available for hepatitis B virus. In Fig. 4 the pie chart depicts the frequency of population of the participants who have taken hepatitis B vaccine and the majority of the participants that is 70.00% said yes that they have taken a vaccination for hepatitis B virus and 24.00% of the participants said no that they haven't taken vaccine for hepatitis B virus and the rest of the participants that is 6.00% of the participants said they don't know if they had taken a vaccine for hepatitis B virus.

In Fig. 5 the pie chart depicts the knowledge among the participants on what age should a child receive a vaccine for hepatitis B and majority of the participating population that is 69.00% of them said 6 -8 months is the correct age for a child to receive a hepatitis B vaccine, 19.00% of the participants said 16 -24 months and the rest of the participants that is 12.00% said 24 months and above is the correct age for a child to receive a hepatitis B vaccine. Similar studies done by Singh also showed similar results as in our study[33]. In Fig. 6 the pie chart depicts the awareness among the participants if they had taken a booster dose and majority of the participants that is 79.00% said no that they had not taken a booster dose following the hepatitis B vaccine and 13.00% of the

participants said yes that they have taken a booster following the hepatitis B vaccine and the rest of the population that is 8.00% said that they don't know if they had taken a booster dose following the hepatitis B vaccination. In Fig. 7 the pie chart depicts the frequency of the participating population if they had checked for susceptibility for hepatitis B and majority of the participants that is 51.00% said yes that they have checked for susceptibility test for hepatitis B and the rest of the participants that is 49.00% said that they have not checked for susceptibility for hepatitis B virus.

In Fig. 8, the pie chart depicts the knowledge of the participants on the recommended full dose for hepatitis B vaccine majority of the participants that is around 36.00% said 3 doses are the recommended full dose for hepatitis B vaccine, 34.00% of the participants said 2 doses, 12.00% of the participants said 1 dose and rest of the participants 18.00% said that they don't know about the full recommended full dose for hepatitis B vaccine. Similar studies done by Gambir[34] and showed similar results. In Fig. 9 the pie chart depicts the knowledge among the participants on the side effect of the hepatitis vaccine, 13.00% of the participants said soreness, redness or swelling in the area where the shot was given, 12.00% of the participants said the side effects of the vaccine are headache, 6.00% of the participants said fever as the side effect and the , majority rest of the participants that is 69.00% said all of the reasons above as the side effects of taking hepatitis B vaccine. In Fig. 10 the pie chart depicts the knowledge among the participants on the transmission of hepatitis B virus through aerosol majority of the participants that is 80.00% said yes that it can be transmitted through aerosol, 14.00% of the participants said no that they don't transmit through aerosol and the rest of the participants 6.00% said they don't know the means of transmission for hepatitis B.

In Fig. 11 the pie chart depicts the knowledge among the participants on the transmission of hepatitis B virus through needle stick injury and majority of the participants 71.00% said yes they are transmitted through needle stick injury , 17.00% said hepatitis B not transmitted through needle stick injury and the rest of the participants 12.00% said that the don't know if hepatitis B is transmitted through needle stick injury. Fig. 13 Represents the association between the dental students on awareness of recommended full dose of hepatitis B vaccine and their year of study, where X axis represents the 'year of study'

and the Y axis represents the 'number of responses'. Blue represents 1dose and green represents 2 doses, yellow represents 3 doses or more and purple represents that they don't know. The association showed p value of 0.026 <0.05 which was statistically significant(chi square test). Fig 14 Represents the association between the dental students on hepatitis transmission through aerosol and their year of study, where X axis represents the 'year of study' and the Y axis represents the 'number of responses'. Blue represents maybe and green represents no and yellow represents yes. The association showed p value of 0.018<0.05 which was statistically significant(chi square test) .Fig 14 represents the association between the dental students exposed to needle stick injury transmission and their year of study, where X axis represents the 'year of study' and the Y axis represents the 'number of responses'. Blue represents maybe and green represents no and yellow represents yes . Majority of 57% were not exposed to needle stick injury among them 50% were 3rd year students and 7% were final year students. . The association showed p value of 0.026 <0.05 which was statistically significant(chi square test)

5. CONCLUSION

From the survey done we can conclude that majority of the dental practitioners are aware of hepatitis B and the vaccination status, however from the study we can see that majority are generally aware of hepatitis B virus and have knowledge, majority of the participants did not know the correct age to get vaccinated or recommended full doses from this we can conclude that they have knowledge and awareness but not the actual benefit about hepatitis B vaccine.

6. LIMITATIONS OF STUDY

The limitations of this study are the sample size of the study is small and no varied population. These are the major limitations of the study and in future similar study can be done with a large population about needle stick injury.

CONSENT AND ETHICAL APPROVAL

Ethical approval and informed consent from the participants were obtained and preserved by authors.

FUNDING

The study was supported by Saveetha Dental College and Hospitals, Saveetha Institute of

Medical and Technical Science & Saveetha University.

ACKNOWLEDGEMENT

The author would like to thank the study participants for their participation and kind cooperation throughout the study and the management of Saveetha dental college and hospitals for giving a platform to carry out this project.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Gurtsevitch VE. Human oncogenic viruses: Hepatitis B and hepatitis C viruses and their role in hepatocarcinogenesis. *Biochemistry (Moscow)*. 2008;73:504–13. Available:<https://doi.org/10.1134/s0006297908050039>.
2. Kruse RL, Kramer JR, Tyson GL, Duan Z, Chen L, El-Serag HB, et al. Clinical outcomes of hepatitis B virus coinfection in a United States cohort of hepatitis C virus- infected patients. *Hepatology*. 2014;60:1871–8. Available:<https://doi.org/10.1002/hep.27337>.
3. Summers J, Mason WS. Replication of the genome of a hepatitis B-like virus by reverse transcription of an RNA intermediate. *Cell* 1982;29:403–15.
4. Advisory Committee on Immunization Practices, Centers for Disease Control and Prevention (CDC). Immunization of health-care personnel: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Recomm Rep*. 2011;60:1–45.
5. Shrestha DB, Khadka M, Khadka M, Subedi P, Pokharel S, Thapa BB. Hepatitis B vaccination status and knowledge, attitude, and practice regarding Hepatitis B among preclinical medical students of a medical college in Nepal. *PLOS ONE*. 2020;15:e0242658. Available:<https://doi.org/10.1371/journal.pone.0242658>.
6. Poland GA. Determination of deltoid fat pad thickness. Implications for needle length in adult immunization. *JAMA: The Journal of the American Medical Association*.1997;277:1709–11.

- Available:<https://doi.org/10.1001/jama.277.21.1709>.
7. Poland GA, Jacobson RM. Clinical practice: prevention of hepatitis B with the hepatitis B vaccine. *N Engl J Med.* 2004;351:2832–8.
 8. Priyadharsini JV, Vijayashree Priyadharsini J, Smiline Girija AS, Paramasivam A. In silico analysis of virulence genes in an emerging dental pathogen *A. baumannii* and related species. *Archives of Oral Biology* 2018;94:93–8. Available:<https://doi.org/10.1016/j.archoralbio.2018.07.001>.
 9. Vijayashree Priyadharsini J. In silico validation of the non-antibiotic drugs acetaminophen and ibuprofen as antibacterial agents against red complex pathogens. *J Periodontol.* 2019;90:1441–8.
 10. Paramasivam A, Vijayashree Priyadharsini J, Raghunandhakumar S. N6-adenosine methylation (m6A): a promising new molecular target in hypertension and cardiovascular diseases. *Hypertens Res.* 2020;43:153–4.
 11. Vijayashree Priyadharsini J, Smiline Girija AS, Paramasivam A. An insight into the emergence of *Acinetobacter baumannii* as an oro-dental pathogen and its drug resistance gene profile - An in silico approach. *Heliyon.* 2018;4:e01051.
 12. Paramasivam A, Vijayashree Priyadharsini J. Novel insights into m6A modification in circular RNA and implications for immunity. *Cell Mol Immunol.* 2020;17:668–9.
 13. Paramasivam A, Priyadharsini JV, Raghunandhakumar S. Implications of m6A modification in autoimmune disorders. *Cell Mol Immunol.* 2020;17:550–1.
 14. Girija ASS, Shankar EM, Larsson M. Could SARS-CoV-2-Induced Hyperinflammation Magnify the Severity of Coronavirus Disease (CoViD-19) Leading to Acute Respiratory Distress Syndrome? *Front Immunol.* 2020;11:1206.
 15. Jayaseelan VP, Arumugam P. Exosomal microRNAs as a promising theragnostic tool for essential hypertension. *Hypertens Res.* 2020;43:74–5.
 16. Ushanthika T, Smiline Girija AS, Paramasivam A, Priyadharsini JV. An in silico approach towards identification of virulence factors in red complex pathogens targeted by reserpine. *Nat Prod Res.* 2021;35:1893–8.
 17. Ramalingam AK, Selvi SGA, Jayaseelan VP. Targeting prolyl tripeptidyl peptidase from *Porphyromonas gingivalis* with the bioactive compounds from *Rosmarinus officinalis*. *Asian Biomed.* 2019;13:197–203.
 18. Kumar SP, Girija ASS, Priyadharsini JV. Targeting NM23-H1-mediated inhibition of tumour metastasis in viral hepatitis with bioactive compounds from *Ganoderma lucidum*: A computational study. *Pharmaceutical-Sciences.* 2020; 82. Available:<https://doi.org/10.36468/pharmaceutical-sciences.650>.
 19. Mathivadani V, Smiline AS, Priyadharsini JV. Targeting Epstein-Barr virus nuclear antigen 1 (EBNA-1) with *Murraya koengii* bio-compounds: An in-silico approach. *Acta Virol* 2020;64:93–9.
 20. Samuel SR, Kuduruthullah S, Khair AMB, Shayeb MA, Elkaseh A, Varma SR. Dental pain, parental SARS-CoV-2 fear and distress on quality of life of 2 to 6 year-old children during COVID-19. *Int J Paediatr Dent* 2021;31:436–41.
 21. Samuel SR. Can 5-year-olds sensibly self-report the impact of developmental enamel defects on their quality of life? *Int J Paediatr Dent* 2021;31:285–6.
 22. Barma MD, Muthupandiyan I, Samuel SR, Amaechi BT. Inhibition of *Streptococcus mutans*, antioxidant property and cytotoxicity of novel nano-zinc oxide varnish. *Arch Oral Biol* 2021;126:105132.
 23. Teja KV, Ramesh S. Is a filled lateral canal - A sign of superiority? *J Dent Sci.* 2020;15:562–3.
 24. Reddy P, Krithikadatta J, Srinivasan V, Raghu S, Velumurugan N. Dental Caries Profile and Associated Risk Factors Among Adolescent School Children in an Urban South-Indian City. *Oral Health Prev Dent.* 2020;18:379–86.
 25. Jayaseelan VP, Paramasivam A. Emerging role of NET inhibitors in cardiovascular diseases. *Hypertens Res.* 2020;43:1459–61.
 26. Iswarya Jaisankar A, Smiline Girija AS, Gunasekaran S, Vijayashree Priyadharsini J. Molecular characterisation of *csgA* gene among ESBL strains of *A. baumannii* and targeting with essential oil compounds from *Azadirachta indica*. *Journal of King Saud University - Science* 2020;32:3380–7.

27. Girija AS. Fox3 (+) CD25 (+) CD4 (+) T-regulatory cells may transform the nCoV's final destiny to CNS! COMMENT 2021.
28. Lekha L, Raja KK, Rajagopal G, Easwaramoorthy D. Synthesis, spectroscopic characterization and antibacterial studies of lanthanide(III) Schiff base complexes containing N, O donor atoms. J Mol Struct. 2014;1056-1057:307–13.
29. Neelakantan P, Cheng CQ, Mohanraj R, Sriraman P, Subbarao C, Sharma S. Antibiofilm activity of three irrigation protocols activated by ultrasonic, diode laser or Er:YAG laser in vitro. Int Endod J. 2015;48:602–10.
30. Sahu D, Kannan GM, Vijayaraghavan R. Size-dependent effect of zinc oxide on toxicity and inflammatory potential of human monocytes. J Toxicol Environ Health A. 2014;77:177–91.
31. Kavitha M, Subramanian R, Narayanan R, Udhayabanu V. Solution combustion synthesis and characterization of strontium substituted hydroxyapatite nanocrystals. Powder Technol. 2014;253:129–37.
32. Vijayakumar GNS, Devashankar S, Rathnakumari M, Sureshkumar P. Synthesis of electrospun ZnO/CuO nanocomposite fibers and their dielectric and non-linear optic studies. J Alloys Compd. 2010;507:225–9.
33. Singh S, Misra B, Panda C, Das H, Nayak K. Study on awareness about Hepatitis B viral infection in coastal Eastern India. Hepatitis B Annual 2009;6:19. Available: <https://doi.org/10.4103/0972-9747.76902>.
34. Gambhir RS, Kapoor V, Jindal G, Garg S, Setia S, Setia S. Attitudes and awareness regarding Hepatitis B and Hepatitis C amongst health-care workers of a tertiary Hospital in India. Annals of Medical and Health Sciences Research. 2013;3:551. Available: <https://doi.org/10.4103/2141-9248.122105>.

© 2021 Kishore and Muralidharan; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:

*The peer review history for this paper can be accessed here:
<https://www.sdiarticle4.com/review-history/74455>*