



A Cross Sectional Survey of Knowledge, Attitude and Practice of Antibiotic Use for Children in Chennai among Mothers

B. Revathi¹ and Kiran Kumar Pandurangan^{2*}

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

²Department of Prosthodontics, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, India.

Authors' contributions

This work was carried out in collaboration between both authors. Author RB designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author KKP managed the analyses of the study and literature searches. Both authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JPRI/2020/v32i2030734

Editor(s):

(1) Dr. Sung-Kun Kim, Northeastern State University, USA.

Reviewers:

(1) Muhammad Akib Yuswar, Tanjungpura University Pontianak, Indonesia.

(2) Olajide Toyé Gabriel, Afe Babalola University, Nigeria.

Complete Peer review History: <http://www.sdiarticle4.com/review-history/59798>

Original Research Article

Received 05 June 2020
Accepted 11 August 2020
Published 28 August 2020

ABSTRACT

Background and Aim: Mothers play a vital role in providing antibiotics to their children since they are too often affected with infections. Hence, the purpose of this study to assess the knowledge, attitude and practice towards antibiotic use of children in Chennai among mothers.

Materials and Methods: A cross sectional survey was conducted among mothers of 250 participants. A questionnaire based online survey was conducted and distributed through the survey planet. The data were collected and tabulated in Microsoft Excel sheets which were transferred to SPSS Version 20 for statistical analysis. Chi square test was performed to check for association between variables.

Results: About 71.3% of the mothers are not aware that antibiotic resistance is a worldwide problem and 53.3% are paying attention to the expiry date of antibiotics and also 59.3% of the respondents give higher doses of antibiotics to their child than what doctor's prescribed. 44% of

*Corresponding author: E-mail: kirankumar.sdc@saveetha.com;

them are providing antibiotics prescribed by local pharmacists without any doctor's prescription. A highly significant association was seen in mothers with monthly income of <30000 rupees do not prefer expensive antibiotics compared to monthly income of >30000 rupees (Chi square test; $p < 0.001$, statistically significant).

Conclusion: The study concluded that the mother's limited knowledge about antibiotics. Hence it is important to facilitate multilevel parent's education programs regarding antibiotic usage and create awareness about the complications of misconceptions of antibiotics.

Keywords: Attitude; antibiotic resistance; children; knowledge; practices.

1. INTRODUCTION

Antibiotics play an important role in people of all ages from infant to old. Infants report to physicians very frequently for various health conditions which are predominantly self-limiting that constitute the frequent physician visits [1]. There is a high chance of inappropriate and unnecessary antibiotic consumption even for self-limiting infections, despite the drug resistance [2]. Mothers play a vital role in administration of antibiotics to children. They determine the antibiotics that have to be given to their children. Due to lack of health education and more trust towards local pharmacists mothers are purchasing the antibiotics in the nearby pharmacies without proper prescription from physicians [3].

Antibiotic resistance is the global threat that arouses many complications in the medical field thereby causing a condition where antibiotics become inadvisable [4]. Self-medication is one of the commonest causes for the emergence of antibiotic resistance due to low socio-economic status, inadequate time, lack of knowledge about antibiotic resistance, ignorance and urge to self-care, the practice of self-medication has been increased gradually in communities [5]. In addition, improper selection of drugs and irregular treatment periods were also some of the reasons for the development of antibiotic resistance among the worldwide population [6]. This urges the health care professionals to discover newer antibiotics to overcome the resistance [7]. The association of antibiotic resistance and inappropriate usage of antibiotics is strongly proven in many studies [8-10].

Many complex factors combined with evolutionary processes derive antibiotic resistance such as improper diagnosis, children demand and poor prescriber skills along with many sociological, psychological and behavioral

determinants [11]. Whereas self-medication practice leads to adverse reaction, resource wastage, delay in cure and dependence [12]. The most common contributing factor for emission of antibiotic resistance is utilizing the antibiotics without doctor's recommendation [13]. The complications of self-medication do not appear in a short period of time but the outbreak tends to be massive.

The impact of antibiotic unawareness not only affects the children but also the entire community in a gradual manner thereby leading to antibiotic resistance [14]. Previously our department has published extensive research on various aspects of prosthetic dentistry [15-31], this vast research experience has inspired us to do a research survey to assess the knowledge, attitude and practice of antibiotic use for children in Chennai among mothers.

2. MATERIALS AND METHODS

2.1 Study Setting

A cross sectional survey was conducted among mothers using a self-administered questionnaire.

2.2 Study Subjects

A total of 250 participants have been randomly enrolled and mothers aged between less than 35 and more than 35 years of age.

2.2.1 Inclusion criteria

Mothers with all ages having at least one child between 6 months- 12 years were included in this study.

2.2.2 Exclusion criteria

Participants not willing to participate were excluded from the study.

2.3 Methodology

A questionnaire based online survey conducted among 250 mothers. The survey has been created by using the link called survey planet. A total of 15 questions were asked related to antibiotic usage in children among mothers. The questionnaire was divided into four sections which elicit the mother's socio-demographic status, knowledge, practice and attitude towards antibiotics which was reviewed and modified by Sireen M et al., [1] and Panagakou SG et al., [32].

2.4 Statistical Analysis

The data was collected and tabulated in Microsoft Excel sheets and were imported into the IBM SPSS Statistics for Windows, Version 20.0. Chicago. Chi-square test was performed to evaluate the statistical difference between the two variables, where p value < 0.05 is considered statistically significant with a confidence interval of 95%. Pie charts and bar charts were used for pictorial representation for the result of the present study.

3. RESULTS

Socio-economic and demographic characteristics of mothers are shown in Table 1. Responses related to antibiotic about knowledge, attitudes, and practices are shown in Table 2. Among 250 participants in which 57.6% (144) of the mothers agreed that antibiotics are used against viral and bacterial infect. 48% (120) participants believe that antibiotics do not have any side effects and 35.2% (88) of the participants agreed that antibiotic resistance is a worldwide problem. 67.2% (168) mothers agreed that antibiotics are used to treat pain. Nearly 44.8% (112) of the mothers reported self-medication and 55.2% (138) reported only after doctor's prescription. 28% (70) of the mothers do not pay attention to the expiry date. Majority, 60% (150) of the mothers responded that they do not decide the antibiotics for their child. 17.3% (173) of the respondents do not prefer antibiotics which are expensive. 56.8% (142) of the mothers give higher doses of antibiotics than the doctor prescribed. 81.2% (203) of them are confident with their doctor's decision.

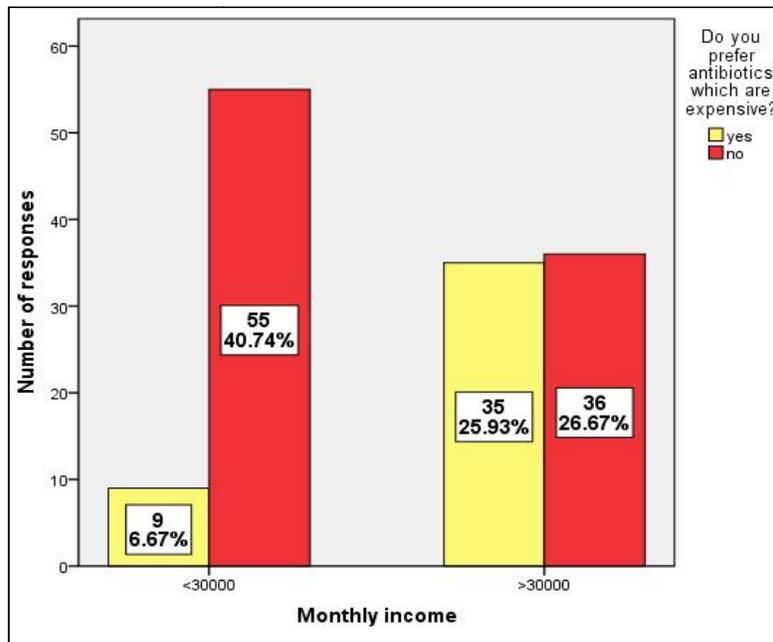


Fig. 1. Bar graph depicting the association between monthly income of the mothers and preference of expensive antibiotics. X axis represents the monthly income and Y axis represents the question, “Do you prefer antibiotics which are expensive?”. Yellow colour denotes “Yes” and Red denotes “No”. Mothers with monthly income of <30000 rupees do not prefer expensive antibiotics compared to monthly income of >30000 rupees. Chi square test was done and association was found to be statistically significant (p value <0.05).

Table 1. Socio-demographic details of the study subjects in antibiotic use KAP study in Chennai population

Variables	Frequency	Mean (%)
Age		
<35 years	88	35.2
>35 years	162	64.8
Mean age	35	
Education		
< High school	112	44.8
> High school	138	55.2
Occupation		
Homemaker	116	46.4
Medical field	36	14.4
Non-medical field	98	39.2
Monthly income(Rupees)		
<Rs. 30000	64	47.4
>Rs. 30000	71	52.6

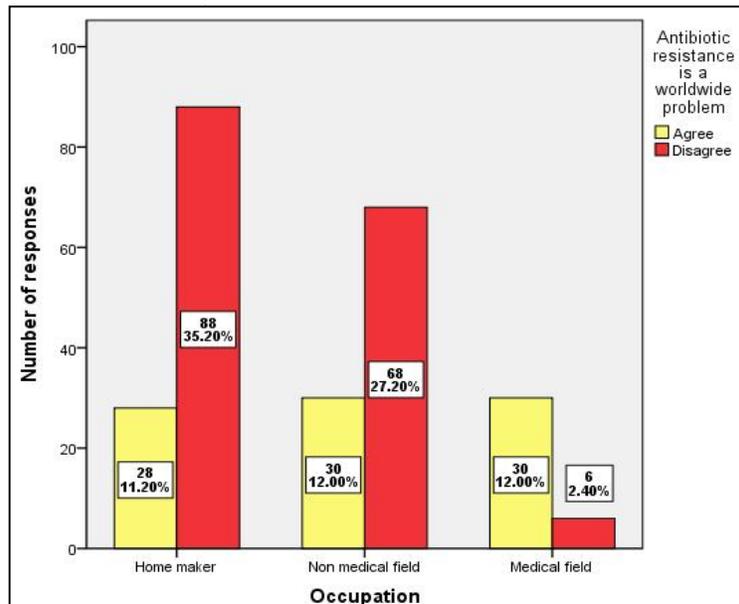


Fig. 2. Bar graph depicting the association between occupation of mothers and knowledge about antibiotic resistance. X axis represents the occupation and Y axis represents the statement, “Antibiotic resistance is a worldwide problem”. Yellow colour denotes the agree and red colour denotes disagreement of the statement. Mothers who are homemakers and working in non medical field have less knowledge regarding antibiotic resistance compared to the medical field. Chi square test was done and association was statistically significant (p value <0.05)

On assessing the practice of mothers regarding antibiotic use, about 34.8% (87) of the mothers do store antibiotics for future purposes. Nearly 60.4% (151) of the mothers have given antibiotics to their child without doctor's advice. About 80.4% (201) of the mothers do consult a doctor and 19.6% (49) reported that they buy

more antibiotics. 80.4% (201) of the mothers do consult a doctor and 19.6% (49) reported that they buy more antibiotics. Whereas, 71.6% (179) of mothers they won't give leftover antibiotics to their child. 36.4% (91) of the mothers agreed that they have given antibiotics prescribed by pharmacists.

Table 2. Mother's knowledge, attitudes and practices related to antibiotic use for children

Variables	Answer	n(%)
Knowledge		
1. Antibiotics are used against viral and bacterial infections.	Yes	57.6% (144)
	No	42.4% (106)
2. Antibiotics have no side effects.	Yes	48% (120)
	No	52% (130)
3. Antibiotic resistance is a worldwide problem.	Yes	35.2% (88)
	No	64.8% (162)
4. Antibiotics are used to treat pain.	Yes	67.2% (168)
	No	32.8% (82)
Attitudes		
5. If your child was affected by the common cold, antibiotic treatment should be started by?	Self-medication	44.8% (112)
	After doctor's prescription	55.2% (138)
6. Do you pay attention to the expiry date?	Yes	28% (70)
	No	72% (180)
7. Will you decide the antibiotic for the child should receive according to their condition?	Yes	40% (100)
	No	60% (150)
8. Do you prefer antibiotics which are expensive?	Yes	30.8% (77)
	No	69.2% (173)
9. Do you give your child a higher dose of antibiotics than what doctor prescribed?	Yes	56.8% (142)
	No	43.2% (108)
10. Are you confident with your doctor's decision?	Yes	81.2% (203)
	No	18.8% (47)
Practices		
11. Do you store antibiotics for future use?	Yes	34.8% (87)
	No	65.2% (163)
12. Have you ever given your child antibiotics without doctor advice?	Yes	60.4% (151)
	No	39.6% (99)
13. What do you do when antibiotics are not effective?	Buy more antibiotics	19.6% (49)
	Consult doctor	80.4% (201)
14. Have you ever given leftover antibiotics from home to your child?	Yes	28.4% (71)
	No	71.6% (179)
15. Have you ever administered antibiotics prescribed by pharmacists?	Yes	36.4% (91)
	No	63.6% (159)

In the current study, a significant association was found between monthly income and preference of expensive antibiotics ($p < 0.05$) (Fig. 1) and between occupation of mothers and knowledge about antibiotic resistance ($p < 0.05$) (Fig. 2). A significant difference was seen between the education level of mothers and awareness regarding the initiation of antibiotic treatment if their child was affected by the common cold (Fig. 3). Association between occupation and knowledge of antibiotic side effects was also found though it was not significant ($p > 0.05$) (Fig. 4) and also between occupation and practice of providing higher doses of antibiotics than doctor's prescription ($p > 0.05$) (Fig. 5).

4. DISCUSSION

From the study, 57.6% of the mothers are aware that antibiotics were used against viral and

bacterial infections. In contrast, only 33% of the mothers are aware in the study was conducted by Gualano et al among Turkey population [33]. Majority of the participants responded that antibiotics do not have any side effects. Since they are predominantly unaware of the side effects, consumption of antibiotics became inappropriate and easily got affected with post-complications. Though 35.2% of the participants are having the knowledge that antibiotic resistance is a worldwide problem, they still practice antibiotics without proper protocol. In the previous study done by Alkaeff et al., 2019 [34], where 51.9 % have the knowledge about antibiotic resistance which is higher compared to the present study. Nearly 40% agreed that they decide the antibiotics that have to be given to their child according to his/her condition. Most commonly they do self-medication by relying on

the previous experience of the same condition. About 30.8% of the respondents prefer expensive antibiotics for their children. Hence, time constraints and financial status are the most important reasons for this attitude. About 56.8% of the participants accept that they give higher doses of antibiotics than what the doctor prescribed if the condition is not well within a short period. No opposing findings were reported.

On assessing the practice, about 34.8% do store antibiotics for future use. In contrast, only 18% of the mothers are dealing with leftover antibiotics in a previous study done by Agarwal et al., among Indian population [35]. Following which, 36.4% of mothers use medicines from local pharmacists without prescription. This result completely proves that parents don't have enough knowledge about antibiotic usage. Similar to this present study done by Nepal et al., [36] reported that 21.4 % of the parents are taking the antibiotics from pharmacists without any prescription due to time constraints.

Mothers with a monthly income of less than 30000 rupees and do not prefer expensive antibiotics which is a strong significant difference in the current study. A similar association was found in the study conducted by Abobotain et al., [37]. Correlating the occupation and knowledge about antibiotic resistance, it was found that mothers who are under the medical field have better knowledge about antibiotic resistance compared to non-medical fields. Since their regular work and daily basis was about the information of antibiotics. But misconceptions are still present due to lack of implementing that knowledge into positive attitudes and practice in their children. The results of this study were contradictory with the previous studies of Kuzujanakis et al., [38] and Pereira et al., [39]. Although physicians are the first influencers on antibiotics for mothers, the family and friends act as a second source of information about antibiotics and also mothers tend to follow and get influenced easily by their family rather than doctors [40]. Hence the surroundings play a significant role in influencing the mothers

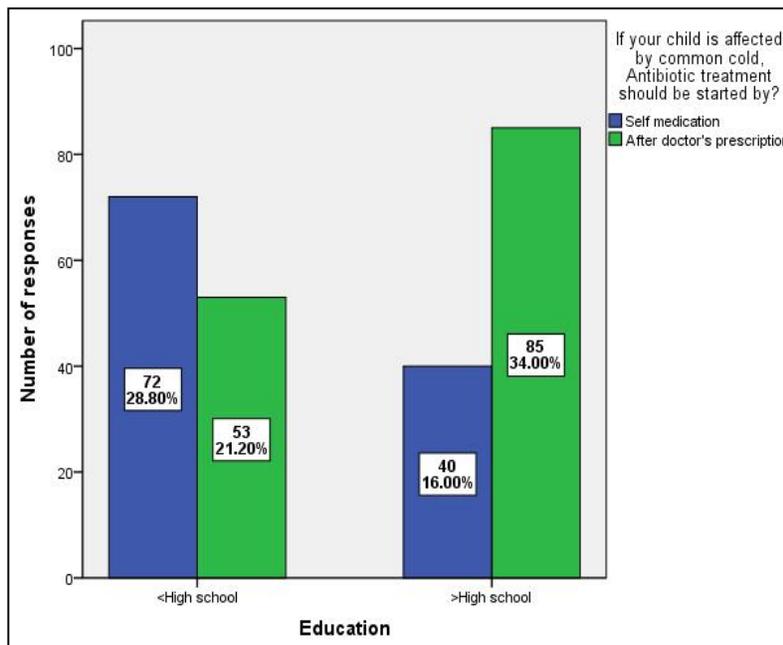


Fig. 3. Bar graph showing the association between education level of mothers and awareness regarding the initiation of antibiotic treatment if their child was affected by common cold. X axis represents the education and Y axis represents the question, “If your child is affected by common cold, antibiotic treatment should be started by?” Blue colour denotes self-medication and Green denotes after doctor’s prescription. Mothers with an education level of above college reported that antibiotic treatment should be started only after doctor’s prescription compared to below college level of mothers. Whereas below college level of mothers highly practiced self-medication. Chi square test was done and the association was statistically significant (p value <0.05)

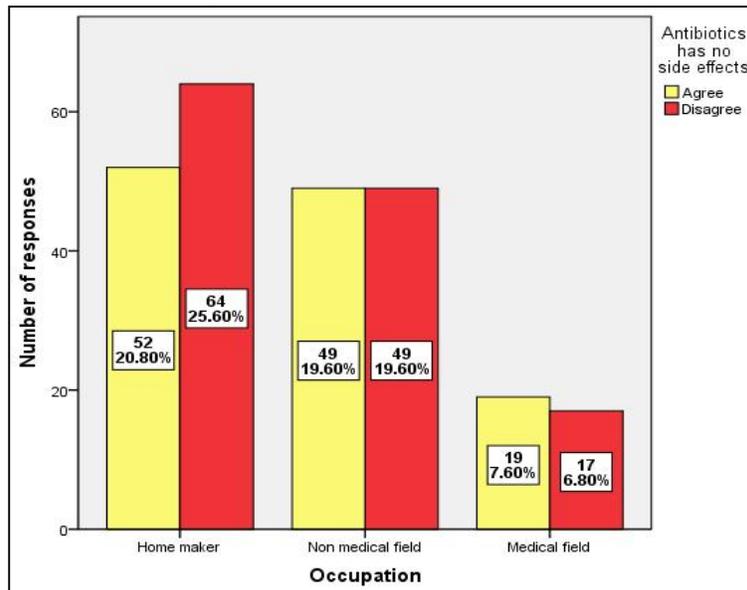


Fig. 4. Bar graph depicting the association between occupation and knowledge of antibiotic side effects. X axis represents the occupation and Y axis represents the statement, “Antibiotics has no side effects”. Yellow colour denotes Agree and red denotes Disagree. Homemakers highly disagree that antibiotics do not have any side effects. Chi square test was done and the association was not statistically significant (p value >0.05)

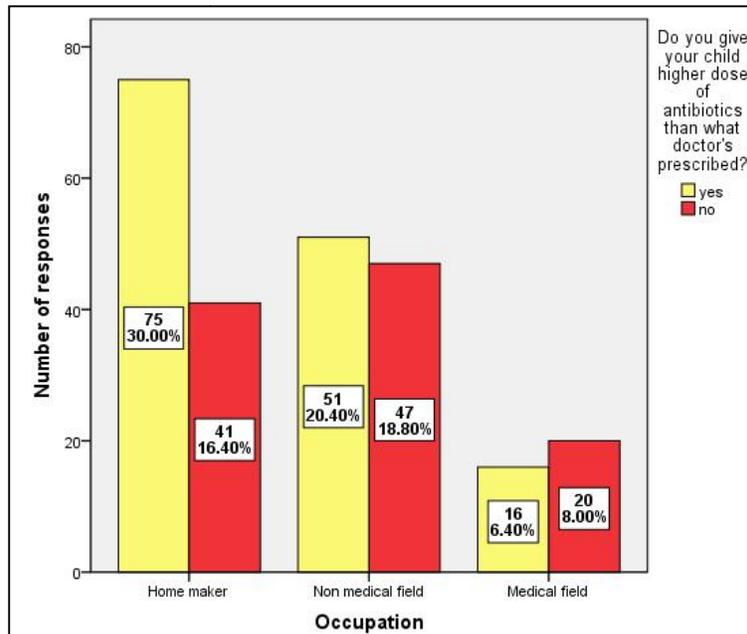


Fig. 5. Bar graph depicting the association between occupation and practice of providing higher doses of antibiotics than doctor's prescription. X axis represents the occupation and Y axis represents the question, “Do you give your child higher a dose of antibiotics than what doctor's prescribed?”. Home makers provide higher doses of antibiotics than doctor's prescription followed by mothers working in non-medical field and medical field. Chi square test was done and the association was not statistically significant (p value >0.05)

regarding antibiotic use. Mothers above high school education showed better practice of antibiotics than mothers with below high school education. A similar association was found in the study conducted by Voidazan et al., [41]. In this study, homemakers highly disagree that antibiotics do not have any side effects compared to occupational mothers. No similar or contrary findings were found related to this result. Unfortunately, Home makers provide higher doses of antibiotics than doctor's prescription followed by mothers working in non-medical field and medical field.

There are still some limitations in the current study since it was performed with small sample size. Hence, future studies must be conducted among mothers with large sample sizes to get a better understanding about their antibiotic usage and how they implement it in their day to day life for the welfare of their children. Studies must also show interest in guiding the knowledge to mothers after completing the questionnaire.

5. CONCLUSION

The study concluded that the mother's limited knowledge about antibiotics. It is important to facilitate multilevel parent's education programs regarding antibiotic usage and create awareness about the complications of misconceptions of antibiotics. Health care professionals must take responsibility to promote the patients consultation skills, thereby reducing antibiotic abuse. Social media must emphasize the importance of judicious use of antibiotics and reinforce adequate awareness about antibiotic resistance that acts as an economic burden to the problem.

CONSENT

As per international standard or university standard, patient's written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

Ethical clearance was obtained from the Institution Ethical Committee, IEC approval number: IHEC/SDC/UG-MICRO/19/01.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Alkhaldi SM, Al-Mahmoud MF, Kanaan H. Mothers' Knowledge, Attitudes and practices of antibiotic use for children in Jordan. *Jordan Medical Journal*. 2015;49:215–26. Available: <http://dx.doi.org/10.12816/0028174>.
2. Sawair FA, Baqain ZH, Abu Karaky A, Abu Eid R. Assessment of self-medication of antibiotics in a Jordanian population. *Med Princ Pract*. 2009;18(1):21-25.
3. Vaz LE, Kleinman KP, Lakoma MD, Dutta-Linn MM, Nahill C, Hellinger J, et al. Prevalence of parental misconceptions about antibiotic use. *Pediatrics*. 2015; 136(2):221-231.
4. Alumran A, Hurst C, Hou XY. Antibiotics Overuse in Children with Upper Respiratory Tract Infections in Saudi Arabia: Risk factors and potential interventions. *Clinical Medicine and Diagnostics*. 2011;1(1):8-16.
5. Bennadi D. Self-medication: A current challenge. *J Basic Clin Physiol Pharmacol*. 2013;5(1):19-23.
6. Ventola CL. The antibiotic resistance crisis: part 1: causes and threats. *P T*. 2015; 40(4):277-283.
7. Lee C-R, Cho IH, Jeong BC, Lee SH. Strategies to minimize antibiotic resistance. *Int J Environ Res Public Health*. 2013;10(9):4274–4305.
8. Panagakou SG, Spyridis N, Papaevangelou V, Theodoridou KM, Goutziana GP, Theodoridou MN, et al. Antibiotic use for upper respiratory tract infections in children: A cross-sectional survey of knowledge, attitudes, and practices (KAP) of parents in Greece. *BMC Pediatr*. 2011;11:60.
9. Aboul AMF, El-Damaty SE, Abdel FYM. Mother's knowledge about antibiotic and role of self-prescription. *J Egypt Public Health Assoc*. 1998;73(1-2):57-69.
10. Bert F, Gualano MR, Gili R, Scaioli G, Lovato E, Angelillo IF, et al. Knowledge and attitudes towards the use of antibiotics in the paediatric age group: A multicenter survey in Italy. *Eur J Public Health*. 2017;27(3):506–512.
11. Espinosa B. The determinants of the antibiotic resistance process [Internet]. *Infection and Drug Resistance*; 2009. Available: <http://dx.doi.org/10.2147/idr.s4899>

12. Fainzang S. Managing medicinal risks in self-medication. *Drug Saf.* 2014;37(5): 333–342.
13. Rather IA, Kim BC, Bajpai VK, Park YH. Self-medication and antibiotic resistance: Crisis, current challenges and prevention [Internet]. *Saudi Journal of Biological Sciences.* 2017;24:808–812. Available:<http://dx.doi.org/10.1016/j.sjbs.2017.01.004>
14. Llor C, Bjerrum L. Antimicrobial resistance: Risk associated with antibiotic overuse and initiatives to reduce the problem. *Ther Adv Drug Saf.* 2014;5(6):229–241.
15. Jain AR, Nallaswamy D, Ariga P, Ganapathy DM. Determination of correlation of width of maxillary anterior teeth using extraoral and intraoral factors in Indian population: A systematic review. *World J Dent [Internet];* 2018. Available:https://www.researchgate.net/profile/Ashish_Jain52/publication/323548671_Determination_of_correlation_of_width_of_maxillary_anterior_teeth_using_extraoral_and_intraoral_factors_in_indian_population_A_systematic_review/links/5b00347c0f7e9be94bd8caf9/Determination-of-correlation-of-width-of-maxillary-anterior-teeth-using-extraoral-and-intraoral-factors-in-indian-population-A-systematic-review.pdf
16. Jyothi S, Robin PK, Ganapathy D, Others. Periodontal health status of three different groups wearing temporary partial denture. *Research Journal of Pharmacy and Technology.* 2017;10(12):4339–4342.
17. Pandurangan KK, Veeraiyan DN, Nesappan T. *In vitro* evaluation of fracture resistance and cyclic fatigue resistance of computer-aided design-on and hand-layered zirconia crowns following cementation on epoxy dies. *J Indian Prosthodont Soc.* 2020;20(1):90–96.
18. Selvan SR, Ganapathy D. Efficacy of fifth generation cephalosporins against methicillin-resistant *Staphylococcus aureus* - A review. *Research Journal of Pharmacy and Technology.* 2016;9(10):1815–1818.
19. Ganapathy D, Sathyamoorthy A, Ranganathan H, Murthykumar K. Effect of resin bonded luting agents influencing marginal discrepancy in all ceramic complete veneer crowns. *J Clin Diagn Res.* 2016;10(12):ZC67–ZC70.
20. Subasree S, Murthykumar K, et al. Effect of aloe vera in oral health- A review. *Research Journal of Pharmacy and Technology.* 2016;9(5):609–612.
21. Jain A, Ranganathan H, Ganapathy D. Cervical and incisal marginal discrepancy in ceramic laminate veneering materials: A SEM analysis [Internet]. *Contemporary Clinical Dentistry.* 2017;8:272. Available:http://dx.doi.org/10.4103/ccd.ccd_156_17
22. Vijayalakshmi B, Ganapathy D. Medical management of cellulitis. *Research Journal of Pharmacy and Technology.* 2016;9(11): 2067–2070.
23. Ganapathy DM, Kannan A, Venugopalan S. Effect of coated surfaces influencing screw loosening in implants: A systematic review and meta-analysis [Internet]. *World Journal of Dentistry.* 2017;(8):496–502. Available:<http://dx.doi.org/10.5005/jp-journals-10015-1493>
24. Ashok V, Suvitha S. Awareness of all ceramic restoration in rural population. *Research Journal of Pharmacy and Technology.* 2016;9(10):1691–1693.
25. Ashok V, Nallaswamy D, Benazir Begum S, Nesappan T. Lip bumper prosthesis for an acromegaly patient: A clinical report. *J Indian Prosthodont Soc.* 2014;14(1):279–282.
26. Venugopalan S, Ariga P, Aggarwal P, Viswanath A. Magnetically retained silicone facial prosthesis. *Niger J Clin Pract.* 2014;17(2):260–264.
27. Kannan A, Venugopalan S. A systematic review on the effect of use of impregnated retraction cords on gingiva [Internet]. *Research Journal of Pharmacy and Technology.* 2018;11:2121. Available:<http://dx.doi.org/10.5958/0974-360x.2018.00393.1>
28. Basha FYS, Ganapathy D, Venugopalan S. Oral Hygiene Status among Pregnant Women [Internet]. *Research Journal of Pharmacy and Technology.* 2018;11:3099. Available:<http://dx.doi.org/10.5958/0974-360x.2018.00569.3>
29. Anjum AS, Ganapathy D, Kumar K. Knowledge of the awareness of dentists on the management of burn injuries on the face. *Drug Invention Today [Internet].* 2019;11(9). Available:https://www.researchgate.net/profile/Kiran_Pandurangan2/publication/337223550_Knowledge_of_the_awareness_of_dentists_on_the_management_of_burn_injuries_on_the_face/links/5dcbff5fa6fdcc5750

- 470755/Knowledge-of-the-awareness-of-dentists-on-the-management-of-burn-injuries-on-the-face.pdf
31. Ramya G, Pandurangan K, Ganapathy D. Correlation between anterior crowding and bruxism-related parafunctional habits. Drug Invention Today [Internet]. 2019;12(10). Available: https://www.researchgate.net/profile/Kiran_Pandurangan2/publication/337223674_Correlation_between_anterior_crowding_and_bruXism-related_parafunctional_habits/links/5dCC083a92851c81804bf0fd/Correlation-between-anterior-crowding-and-bruxism-related-parafunctional-habits.pdf
 32. Shree Y, Kumar K, Ganapathy D. Available: https://www.researchgate.net/profile/Kiran_Pandurangan2/publication/339873903_Awareness_of_basic_life_support_among_dental_students/links/5e69b30e458515c5de628420/Awareness-of-basic-life-support-among-dental-students.pdf
 33. Panagakou SG, Theodoridou MN, Papaevangelou V, Papastergiou P, Syrogiannopoulos GA, Goutziana GP, et al. Development and assessment of a questionnaire for a descriptive cross-sectional study concerning parents' knowledge, attitudes and practises in antibiotic use in Greece. BMC Infect Dis. 2009;9:52.
 34. Gualano MR, Gili R, Scaioli G, Lovato E. Knowledge and attitudes towards the use of antibiotics in the paediatric age group: a multicenter survey in Italy. Eur J Public Health [Internet]. 2017; 27(3):506-512. Available: <https://academic.oup.com/eurpub/article-abstract/27/3/506/2528271>
 35. Alkaff RN, Kamigaki T, Saito M, Ariyanti F, Iriani DU, Oshitani H. Use of antibiotics for common illnesses among children aged under 5 years in a rural community in Indonesia: A cross-sectional study. Trop Med Health. 2019;47:45.
 36. Agarwal S, Yewale VN, Dharmapalan D. Antibiotics use and misuse in children: A knowledge, attitude and practice survey of parents in India. J Clin Diagn Res. 2015;9(11):SC21–SC24.
 37. Nepal A, Hendrie D, Robinson S, Selvey LA. Survey of the pattern of antibiotic dispensing in private pharmacies in Nepal. BMJ Open. 2019;9(10):e032422.
 38. Abobotain AH, Sheerah HA, Alotaibi FN, Joury AU, Mishiddi RM, Siddiqui AR, et al. Socio-demographic determinants of antibiotic misuse in children. Saudi Med J. 2013;34(8):832–840.
 39. Kuzujanakis M, Kleinman K, Rifas-Shiman S, Finkelstein JA. Correlates of parental antibiotic knowledge, demand, and reported use. Ambul Pediatr. 2003;3(4): 203–210.
 40. Parimi N, Pinto Pereira LM, Prabhakar P. Caregivers' practices, knowledge and beliefs of antibiotics in paediatric upper respiratory tract infections in Trinidad and Tobago: A cross-sectional study. BMC Fam Pract. 2004;5:28.
 41. Zucco R, Lavano F, Anfosso R, Bianco A, Pileggi C, Pavia M. Internet and social media use for antibiotic-related information seeking: Findings from a survey among adult population in Italy. Int J Med Inform. 2018;111:131–139.
 42. Voidăzan S, Moldovan G, Voidăzan L, Zazgyva A, Moldovan H. Knowledge, attitudes and practices regarding the use of antibiotics. Study on the general population of Mureş County, Romania. Infect Drug Resist. 2019;12:3385–3396.

© 2020 Revathi and Pandurangan; 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:
<http://www.sdiarticle4.com/review-history/59798>