Journal of Public Health and Development
Vol.20 No.2 May-August 2022

ORIGINAL ARTICLE

Factors Affecting Oral Health Service Utilization of Differently-abled School Children in Kathmandu, Nepal

Shristi Sharma[1], Nitaya Vajanapoom[1]

[1]Faculty of Public Health, Thammasat University, Thailand

Corresponding Author Shristi Sharma **Email:** shristi@fph.tu.ac.th

Received: 2 November 2021 **Revised:** 23 December 2021 **Accepted:** 3 January 2021**Available online:** May 2022
DOI: 10.55131/jphd/2022/200208

ABSTRACT

Lack of oral health care utilization is a common problem among differently- abled children. As a result, oral diseases are often identified in this cohort. This study applied the Anderson health care utilization model to examine the factors associated with the oral health service utilization (OHSU) among the differently-abled school children in Kathmandu city of Nepal. A cross-sectional study was conducted among 400 school children aged 7-18 years old enrolled in 7 schools for differently-abled children in Kathmandu. The OHSU data and the data on the predisposing factors, the enabling factors, and the need factors were self-reported by the parents/legal guardians of the children, using a self-administered questionnaire. An oral examination was performed to assess each child's dental status. Logistic regression was used to assess the association of OHSU with the predisposing factors, the enabling factors, and the need factors. The results showed that the enabling factors (i.e., "affordability", and "good oral health knowledge of parents", and the need factors ("having toothache") were positively associated with OHSU. In contrast, there was negative association between OHSU and the dental status of the children. Overall, the study showed a very low prevalence of oral health service utilization. The findings indicated that family economic status and oral health literacy of parents and their children play a crucial role in the increased usage of oral health services among differently-abled children. This suggests that, a free oral health service and health literacy programs for the parents and their disabled children in Kathmandu may increase OHSU.

Key words:
oral health; factors; oral health service utilization; differently-abled children

Citation:
S. Sharma, N. Vajanapoom. Factors Affecting Oral Health Service Utilization of Differently-abled School Children in Kathmandu, Nepal. J Public Hlth Dev. 2022;20(2):98-109.
(https://doi.org/10.55131/jphd/2022/200208)

INTRODUCTION

Dental caries is the most prevalent oral disease among children, especially those with social disadvantage in developing countries followed by gingivitis[1, 2]. Every person has the right to oral health care access including differently-abled people[3]. Health care accessibility is "The ease with which health care can be reached in the face of financial, organizational, cultural, and emotional barriers" [4]. Access to oral health service is 35% in developing countries, compared to 82% in developed countries [5]. Limited resources are a possible factor hindering access to health care in developing countries.

Utilization of health care is the "quantification or description of the services by persons to prevent and cure health problems, promoting maintenance of health and well-being, or obtaining information about one's health status and prognosis"[6]. In Nepal, 93% of children had never visited a dentist[7], indicating limited utilization of oral health services. Furthermore, oral health care utilization can be even more challenging for differently-abled people in Nepal because they are often discriminated against and perceived as a result of sins in the past[8]. There is no universal health policy coverage for dental problems even for those with disabilities which creates a burden among those populations to utilize costly dental procedures [9]. Moreover, there is a lack of specialized dental professionals and differently- abled-friendly hospitals for the treatment of differently-abled children. The hospitals may be difficult to access for people with physical disabilities or wheelchair users, for example, if the hospital does not have an elevator or wheelchair path[10]. According to the 2011 official census in Nepal, 1.94% of people live with a degree of disability[11].

The evidence suggests that differently-abled children in Nepal are a marginal group and are vulnerable to inequity in oral health service utilization. This drawback could lead to an increased risk of gingivitis and dental caries among them. It is important to understand what factors play a role in preventing them from oral health service utilization. According to a comprehensive literature search, data on differently-abled children in Nepal is limited. This study examined these issues in Kathmandu, where there is a high population of differently-abled children, [12] with the objective to examine the factors associated with the utilization of oral health services among differently-abled school children.

METHODOLOGY

Study population and study sites

A cross-sectional study using Anderson health care utilization model [13] was conducted to investigate the factors affecting oral health service utilization (OHSU) among differently-abled school children in Kathmandu, Nepal. The study population was differently-abled children aged 7-18 years who were enrolled in the schools for disabilities in Kathmandu. In Kathmandu, there are seven schools for children with different types of disabilities including 2 for the blind, 1 for the deaf, 3 for the intellectually disabled, and 1 for the physically disabled. Three out of the seven schools are located in the central part of Kathmandu, and the other four schools are located in the periphery. The school for the deaf is a government school that enrolls only deaf children and has the maximum number of students, and the other six schools are private schools. There was a total of 666 students enrolled in these schools during the study period from March 2021 to May 2021. This comprised of 362 students from the school for the deaf, 161

from the school for the intellectually disabled, 76 from the school for the physically disabled, and 67 from the school for the blind. The sample size of 213 children was estimated with 80% power using the data on the percentage of "parental belief of their children's oral health status" of those who utilized oral health services obtained from a study in China [14]. To deal with possible non-participants, we increased the sample size to 418 children. They were randomly selected from these schools using a proportional stratified sampling approach. The children who were able to participate in an oral examination were selected for the study.

Data Collection

The dependent variable in this study was the OHSU of the differently-abled school children in the past 24 months. According to the Anderson health care utilization model, the independent variables were categorized into predisposing, enabling, and need factors. In this study, the predisposing factors were age, sex, family size, and ethnicity; the enabling factors were parental education, accessibility of oral health service (which referred to the distance between residence and health services and affordability), type of disability, parental knowledge of oral health, and oral health behaviors of children; and the need factors included deft/DMFT index (i.e., Decayed, Extracted, Filled Tooth/ Decayed, Missing, and Filled Tooth) for children with mixed dentition and DMFT index (i.e., Decayed, Missing, Filled Tooth) for children with permanent dentition, gingivitis, toothache and perceived oral health status of children by parents. Oral health examination by a dentist was performed to evaluate dental caries burden (deft/DMFT index and DMFT index) and gingivitis using WHO oral health assessment form[15] and Loe and Silness gingival index criteria[16], respectively. All other independent variables and utilization of oral health services by children in the past 24 months were evaluated by a self-administered questionnaire. The original questionnaire was in English and was translated to the Nepali language and back-translated to English to ensure the correct translation. Content validity was assessed by four experts in the field. According to the feedback given by the experts, the respective questions in the questionnaire were modified (see questionnaire in appendix A).

The ethical clearance was obtained from Thammasat University's ethical committee and Ethical Review Board-Nepal Health Research Council. Permission to conduct the study in the schools was sought from the head of the selected schools. The researcher sought informed consent from the participating students and their parents or legal guardians prior to dental examination and data collection using a structured questionnaire. For the illiterate participants, the researcher explained information fact sheets and informed consent verbally. As the study population was differently-abled children, utmost care, respect, and honor were provided by respecting their feelings and dignity. The questionnaires were completed mostly by mothers of children, and in few cases who lived in care homes, they were completed by legal guardians. If the participants were not able to read and write, then a face-to-face interview for the questionnaire survey was performed by the researcher.

Data analyses

Logistic regression model was used to assess the association of the predisposing factors, the enabling factors, and the need factors with OHSU of the differently-abled school children. Multicollinearity was not identified among the factors in our analyses. Age was included in the model as a continuous variable because a monotonical decline of OHSU with age

categories was observed in crude analysis. We used multiple logistic regression with a stepwise procedure to assess the associations of significant factors from crude analysis with OHSU. We calculated odd ratios and 95% confidence intervals for the associations. All data analyses were performed using the Statistical Package for Social Science (SPSS) version 16.

RESULTS

Study participants

As shown in figure 1, a total of 418 participants were approached for data collection. Of these, 400 participants provided written consent, however 22 refused oral examination and were not included in the study. The study excluded a further 60 participants from the remaining 378 who did not return the questionnaires or provided incomplete data. As a result, 318 participants were included in the data analysis. Of these, 95 were children with mixed dentition (aged 7-12 years) and 223 were children with permanent dentition (aged 13-18 years). Most of them were deaf children (58.5%), followed by those who have intellectual disability (22.3%), blindness (10.1%), and physical disability (9.1%).

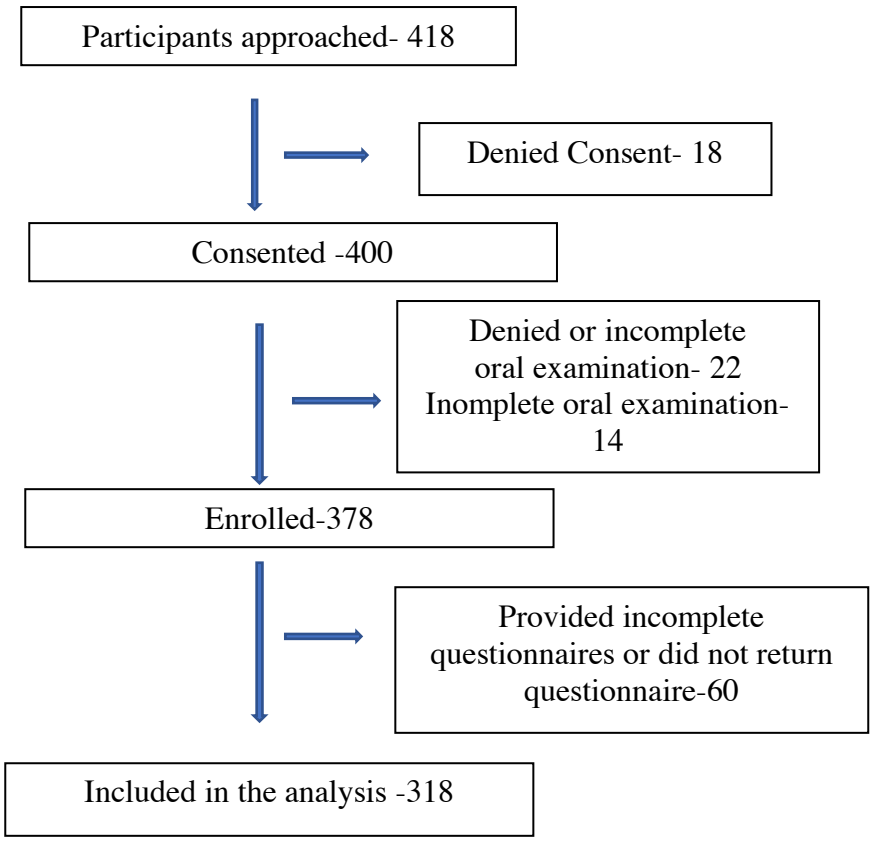

Figure 1 Recruitment of participants

Characteristic of the participants

The study observed a very low percentage of OHSU among differently-abled school children in Kathmandu, i.e., 18.2% for all children, 21.1% among children with mixed dentition, and 17.0% among children with permanent dentition(Figure 2). The characteristics are compared between those with and without OHSU (Table 1). The predisposing factors of the differently-abled children with and without OHSU are relatively similar, except for the mean ages of those with OHSU which is slightly lower than those without OHSU. For the enabling factors, those without OHSU had a higher proportion of parental lower education levels, unaffordability of OHSU cost, physical-related disability, lower parental knowledge scores, and poor oral hygiene than those with OHSU. Nevertheless, other enabling factors of the two groups were relatively similar. Regarding the need factors, differently-abled children without OHSU had mean DMFT and mean deft/DMFT, higher prevalence of gingivitis and toothache than those with OHSU.

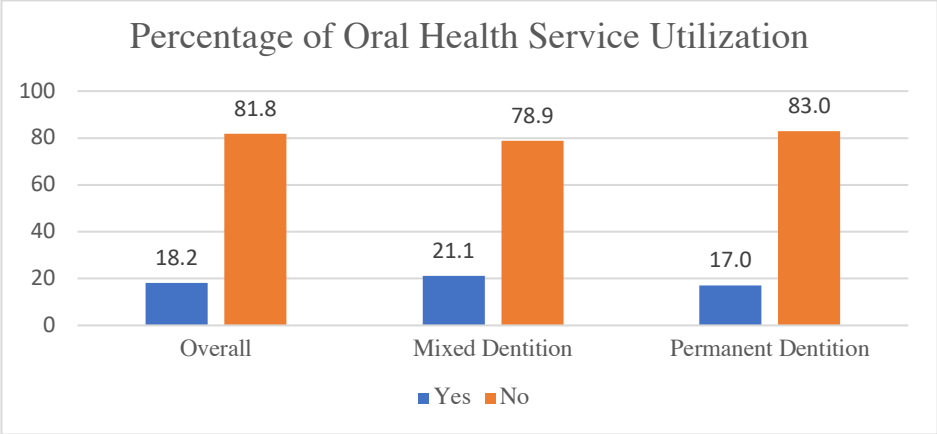

Figure 2 Oral health service utilization of the participants

Table 1 Characteristics of all participants classified by their past 2-years oral health services utilization (OHSU)

Characteristics		Oral health service utilization	
		yes (n= 58)	**no (n= 260)**
Predisposing factors	Mean age of children (sd)	13.03 (3.2)	14.17 (3.3)
	Sex [number, (%)]		
	-Female	25 (43.1)	119 (46.1)
	-Male	33 (56.9)	141 (53.9)
	Mean family size (sd)	5.28 (1.9)	5.14 (2.0)
	Ethnic groups [number, (%)]		
	– Brahmin/Chhetri	29 (50.0)	126 (48.5)
	– Janajati	29 (50.0)	134 (51.5)
Enabling factors	Education of parents [number, (%)]		
	– Illiterate - Secondary	30 (51.7)	200 (76.9)
	– Higher secondary/vocational	19 (32.8)	38 (14.6)

	Characteristics	Oral health service utilization	
		yes (n= 58)	no (n= 260)
	– Bachelor or above	9 (15.5)	22 (8.5)
	Distance [number, (%)]		
	– Less than 3 km	36 (62.1)	166 (63.8)
	– More than 3 km	22 (37.9)	94 (36.2)
	Affordability [number, (%)]		
	– Easy to afford	16 (27.6)	27 (10.4)
	– Just affordable	35 (60.0)	140 (53.8)
	– Unaffordable	7 (12.1)	93 (35.8)
	Difficulty in access [number, (%)]		
	– Yes	47 (81.0)	186 (71.5)
	– No	11 (19.0)	74 (28.5)
	Type of disability [number, (%)]		
	– Deaf	22 (37.9)	164 (63.1)
	– Intellectually disabled	28 (48.3)	43 (16.5)
	– Blind	5 (8.6)	27 (10.4)
	– Physical disability	3 (5.2)	26 (10)
	Knowledge of parents [number, (%)]		
	– Good	36 (62.1)	49 (18.8)
	– Moderate	16 (27.6)	59 (22.7)
	– Poor	6 (10.3)	152 (58.5)
	Oral health behaviors [number, (%)]		
	– Good	14 (24.1)	24 (9.2)
	– Moderate	39 (67.2)	181 (69.6)
	– Poor	5 (8.6)	55 (21.2)
Need factors	Dental status		
	Mean DMFT[1] Score (sd)	1.6 (1.3)	3.7(1.2)
	Mean deft/DMFT[2] Score (sd)	1.7 (1.7)/ 0.2 (0.5)	3.7 (2.2)/ 0.7 (1.0)
	Gingivitis [number, (%)]		
	– Normal	44 (75.9)	106 (40.8)
	– Mild	10 (17.2)	104 (40.0)
	– Moderate	4 (6.9)	50 (19.3)
	Toothache [number, (%)]		
	– Often	5 (8.6)	9 (3.5)
	– Occasional	45 (77.6)	160 (61.5)
	– Never	8 (13.8)	91 (35.0)
	Perceived by parents [number, (%)]		
	– Good	9 (15.5)	48 (18.5)
	– Fair	42 (72.4)	193 (74.2)
	– Poor	7 (12.1)	19 (7.3)

[1] for children with permanent dentition, [2] for children with mixed dentition

Factors associated with oral health service utilization

Table 2 shows the results of crude ORs and adjusted ORs for the association between predisposing factors, enabling factors, and need factors, and OHSU of the differently-abled school children. The significant crude ORs were found for the predisposing factor (age), the enabling factors (parental education, affordability, types of disability, oral health knowledge of parents, and oral health behaviors), and the need factors (DMFT, deft/DMFT scores, gingivitis and toothache) of the differently-abled school children.

In a multiple logistic regression analysis, we did not find any significant predisposing factors as found in the crude analysis. The enabling factors associated with OHSU were observed for "affordability" and "oral health knowledge of parents". The need factors associated with OHSU included "DMFT score" of the children with permanent dentition, "deft/DMFT score" of the children with mixed dentition, and "presence of toothache". Toothache was positively associated with OHSU of the differently-abled school children, but the "DMFT score" of the children with permanent dentition and "deft/DMFT score" of the children with mixed dentition were negatively associated with OHSU of the differently-abled children. Besides, the study observed a relatively strong association with a wide confidence interval of a number of factors comprising, "oral health knowledge of parents: good level (OR= 24.2; 95% CI= 6.7-87.4 for a good level of oral health knowledge and moderate level (OR=7.7; 95% CI= 2.0-29.3), and toothache: often conditions (OR=8.0; 95%CI= 1.0-63.7 and occasional OR=5.3; 95%CI= 1.6-17.0). These findings are considered unstable, although they are statistically significant.

Table 2 Factors associated with oral health services utilization of the entire differently-abled children in the past 2 years

	Factors	**Crude OR (CI 95%)**	**Adjusted OR (CI 95%)**
Predisposing factors	Mean age of children, (sd)	0.9(0.8-0.9)	ns
	Sex [number, (%)]		
	Female	0.8(0.5-1.5)	ns
	Male	1	
	Mean family size (sd)	1.0(0.8-1.2)	ns
	Ethnic groups [number, (%)]		
	– Brahmin/Chhetri	1.0(0.6-1.8)	ns
	– Janajati	1	
Enabling factors	*Education of parents* [number, (%)]		
	– Bachelor or above	2.7(1.1-6.4)	ns
	– Higher secondary/vocational	3.3(1.7-6.5)	
	– Illiterate - Secondary	1	
	Distance [number, (%)]		

	Factors	Crude OR (CI 95%)	Adjusted OR (CI 95%)
	– Less than 3 km	0.9(0.5-1.6)	ns
	– More than 3 km	1	
	Affordability [number, (%)]		
	– Easy to afford	7.8(2.9-21.1)	5.3(1.0-26.5)
	– Just affordable	3.3(1.4-7.7)	5.0(1.3-18.6)
	– Unaffordable	1	1
	Difficulty in access [number, (%)]		
	– No	1.7(0.8-3.4)	ns
	– Yes	1	
	Type of disability [number, (%)]		
	– Deaf	1.1(0.32-4.1)	ns
	– Intellectually disabled	5.6(1.5-20.4)	
	– Blind	1.6(0.3-7.4)	
	– Physical disability	1	
	Oral health knowledge of parents [number, (%)]		
	– Good	18.6(7.4-46.8)	24.2(6.7-87.4)
	– Moderate	6.8(2.5-18.4)	7.7(2.0-29.3)
	– Poor	1	1
	Oral health behaviors [number, (%)]		
	– Good	6.41(2.0-19.8)	ns
	– Moderate	2.3(0.8-6.3)	
	– Poor	1	
Need factors	Dental status (mean, (sd)		
	DMFT score[1]	0.6(0.5-0.7)	0.3 (0.2-0.4)
	deft/DMFT Score [2]	0.5 (0.3-0.7) / 0.4(0.1-0.9)	0.4(0.3-0.5)/ 0.2(0.1-0.6)
	Gingivitis [number, (%)]		
	– Absent	4.5(2.3-8.7)	ns
	– Present	1	
	Toothache [number, (%)]		
	– Often	6.3(1.7-23.4)	8.0(1.0-63.7)
	– Occasional	3.1(1.4-7.0)	5.3(1.6-17.0)
	– Never	1	1

Factors	Crude OR (CI 95%)	Adjusted OR (CI 95%)
Perceived by parents [number, (%)]		
– Good	0.5(0.2-1.6)	ns
– Fair	0.6(0.2-1.5)	
– Poor	1	

[1]for children with permanent dentition, [2] for children with mixed dentition; ns=non-significant (p value >0.05)

DISCUSSIONS

The analyses have shown a relatively low proportion of OHSU among the differently-disabled school children in Kathmandu (18.2%), which is consistent with the evidence found in Nigeria among differently-abled children (14.5%)[17]. This identifies an alarming situation of the lack of oral health care usage for differently-abled children in developing countries. This problem could be attributable to lack of cooperation, communication problems, and parental lack of oral hygiene knowledge [18]. The research further investigated the factors associated with OHSU among these children, applying the Anderson Health Utilization Model. There was no association between the predisposing factors (i.e., age, sex, ethnicity, and family size) and OHSU among the differently-abled children in Kathmandu. However, a few enabling factors (i.e., affordability, oral health knowledge of the parents) and need factors (i.e., DMFT index for children with permanent dentition, deft/DMFT index for children with mixed dentition, and toothache) were significantly associated with OHSU of these children.

Research shows that children from an affordable family have an increased likelihood of OHSU, compared to those from an unaffordable family, in line with studies conducted by Rosa et al., [19]. This study observed a significant increase in oral health services usage in differently-abled children with good and moderate levels of oral health knowledge. The evidence supports the findings reported in previous studies among preschool children in China[20], and among differently-abled populations, in India [21]. This indicates that the oral health of children depends on their parents' oral health knowledge, since they care for their children especially those with disabilities. Therefore, the oral health literacy of parents is an important preventive measure of child oral health problems [22, 23].

Among the significant need factors, the strongest adjusted OR was for children who often suffered toothache, with an extremely wide confidence interval which may have resulted from the small counts of the children with OHSU (see Table 2). Similarly, the crude OR of gingivitis was associated with increased OHSU of differently-abled school children. Children who saw a dentist more regularly may have received dental prophylaxes and therefore may be less likely to have plaque-related gingivitis. Mean DMFT and deft scores were significantly lower among children who received dental care than those who did not, which may be due to possible dental measures to prevent caries. The observed results were inconsistent with the results from a study in China in which a positive association between DMFT and OHSU was reported [20]. The authors of this study stated that children with dental caries were more likely to suffer from pain which will encourage dental clinic attendance. However, this may not be the case for our findings in which the oral health conditions of children is negatively associated with OHSU. This could be explained by the non-significant results for the association between the perception of parents on their child's oral health conditions and OHSU.

This indicates that the parent may not perceive that their child needs a dental health service even if they have poor oral health conditions (i.e., high deft/DMFT scores and DMFT scores).

In this analysis, parental education was not associated with OHSU in the adjusted OR, although it showed association in the crude OR. The finding contradicts previous studies[24, 25]. Besides that, there was no relationship between distance from home to an oral health service facility, whereas, a study in Iowa concluded that long-distance to dental clinics leads to poor utilization of oral health services[25]. Good public transportation service in Kathmandu, which enables convenient traveling to the dental clinic may explain the observed inconsistent findings.

There are a few limitations in the results of this analysis. For instance, sampling error may explain the wide confidence intervals observed in multiple of the adjusted ORs. This error could have resulted from the low prevalence of OHSU among the study participants. Future studies may need a larger sample size to improve the precision of the results. Moreover, most of the data used in this analysis are self-reported, which may bias the results. Nevertheless, this potential bias was minimized because the study hypotheses were not revealed to the participants.

CONCLUSIONS

In summary, the findings reveal a very low proportion of utilization of oral health services among differently-abled school children in Kathmandu and indicate that family's economic status, oral health literacy of parents and their differently-abled children play a crucial role in OHSU among differently-abled school children in Kathmandu. Therefore, health literacy programs focusing on oral health care should be promoted in the schools for differently-abled children and their parents. In addition, oral health services should be included in the basic free health services or covered by health insurance. A comparative study to compare the findings between normal children and differently-abled children is suggested in the future.

ACKNOWLEDGMENT

I would like to acknowledge all the participants for providing the data as well as the principals and the teachers of the schools who had helped me through the data collection procedure.

REFERENCES

1. Youssefi MA, Afroughi S. Prevalence and Associated Factors of Dental Caries in Primary Schoolchildren: An Iranian Setting. Int J Dent. 2020;2020:8731486.
2. Frencken JE, Sharma P, Stenhouse L, Green D, Laverty D, Dietrich T. Global epidemiology of dental caries and severe periodontitis - a comprehensive review. J Clin Periodontol. 2017;44 Suppl 18:S94-s105.
3. Petersen PE. Improvement of global oral health--the leadership role of the World Health Organization. Community Dent Health. 2010;27(4):194-8.
4. Crall JJ. Access to oral health care: Professional and societal considerations. J Dent Educ. 2006;70(11):1133-8.
5. Hosseinpoor AR, Itani L, Petersen PE. Socio-economic inequality in oral healthcare coverage: results from the World Health Survey. J Dent Res. 2012;91(3):275-81.

6. Gellman MD, Turner JR. Encyclopedia of behavioral medicine: Springer New York, NY, USA. 2013.
7. Prasai Dixit L, Shakya A, Shrestha M, Shrestha A. Dental caries prevalence, oral health knowledge and practice among indigenous Chepang school children of Nepal. BMC Oral Health. 2013;13:20.
8. Holmes R, Samuels F, Ghimire A, Thewissen S. Nepal's cash allowances for children with disabilities. ODI Report; 2018.
9. Adhikari SR. Universal Health Coverage Assessment Nepal. 2015.
10. Talib YA, Ghani NIA, Ismail K, Salleh NA. The Provision of the Disabled Facilities in Public Hospitals. MATEC Web of Conferences: EDP Sciences; 2016.
11. Thapaliya MP. A report on disability in Nepal. Australian Himalayan Foundation (AHF); 2016.
12. Ojha G. Disability Atlas Nepal: Kathmandu University, School of Arts; 2016.
13. Andersen RM. Revisiting the behavioral model and access to medical care: does it matter? J Health Soc Behav. 1995;36(1):1-10.
14. Xu M, Yuan C, Sun X, Cheng M, Xie Y, Si Y. Oral health service utilization patterns among preschool children in Beijing, China. BMC Oral Health. 2018;18(1):31.
15. World Health Organization. Oral health surveys: basic methods: World Health Organization; 2013.
16. Silness J, Löe H. Periodontal Disease in Pregnancy II. Correlation Between Oral Hygiene and Periodontal Condition. Acta Odontologica Scandinavica. 1964;22(1):121-35. doi: 10.3109/00016356408993968
17. Onyejaka NK, Folayan MO, Folaranmi N. Barriers and facilitators of dental service utilization by children aged 8 to 11 years in Enugu State, Nigeria. BMC Health Serv Res. 2016;16:93.
18. Duddu M, Muppa R, Nallanchakrava S, Bhupatiraju P. Prevalence of dental caries in people attending special schools in Hyderabad-Secunderabad, India. Journal of Dr NTR University of Health Sciences. 2016;5(2):137-41.
19. da Rosa SV, Moysés SJ, Theis LC, Soares RC, Moysés ST, Werneck RI, et al. Barriers in Access to Dental Services Hindering the Treatment of People with Disabilities: A Systematic Review. Int J Dent. 2020;2020:9074618.
20. Gao X, Ding M, Xu M, Wu H, Zhang C, Wang X, et al. Utilization of dental services and associated factors among preschool children in China. BMC Oral Health. 2020;20(1):9.
21. Sabbarwal B, Puranik M, Uma S. Oral health status and barriers to utilization of services among down syndrome children in Bengaluru City: A cross-sectional, comparative study. JIAPHD. 2018;16(1):4-10.
22. Curi DSC, Figueiredo ACL, Jamelli SR. Factors associated with the utilization of dental health services by the pediatric population: an integrative review. Cien Saude Colet. 2018;23(5):1561-76.
23. Mishra A, Pandey RK, Chopra H, Arora V. Oral health awareness in school-going children and its significance to parent's education level. J Indian Soc Pedod Prev Dent. 2018;36(2):120-4.
24. Camargo MB, Barros AJ, Frazão P, Matijasevich A, Santos IS, Peres MA, et al. Predictors of dental visits for routine check-ups and for the resolution of problems among preschool children. Rev Saude Publica. 2012;46(1):87-97.

25. Wehby GL, Shane DM, Joshi A, Momany E, Chi DL, Kuthy RA, et al. The Effects of Distance to Dentists and Dentist Supply on Children's Use of Dental Care. Health Serv Res. 2017;52(5):1817-34. doi: 10.1111/1475-6773.12556