Assessment of Oral Health Care Delivery System in Greater Noida Using Five A’s Model

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BACKGROUND: Access to dental health services refers not only to utilization but also to the extent by which the utilization is judged as per the professional norms using five independent dimensions of accessibility, availability, accommodation, affordability and acceptability.

AIM: The aim of the study is to assess the dental services utilization among population of Greater Noida using Five A’s model.

MATERIALS AND METHOD: The study was conducted in Dental College in Greater Noida. This cross-sectional study was carried out on the 200 subjects using convenient sampling on the patients visiting dental OPD. A self-administered structured questionnaire in English and Hindi language was used. Data was entered in the Microsoft excel sheet and analysed using SPSS (version 20.0).

RESULTS: Mean level of access to dental services in the study population was 60.3. Corresponding figures for affordability, availability, accessibility, accommodation and acceptability were 55.2 ± 12.1, 57.1± 12.8, 60.75 ± 14.7, 61.75 ± 8.7, 58.65± 11.4 respectively.

CONCLUSION: According to the results of our study, the level of access to dental care services is not very good with family income, location and level of education being the determinants of this access.

KEYWORDS: Oral Health Care Delivery, Accessibility, Affordability, Availability, Acceptability

INTRODUCTION

Good health is the condition where both our body as well as our mind are functioning properly. Over the years, evidence-based information has suggested that the health of our mouth, mirrors the conditions of our body as a whole. Dental disorders have affected mankind from time immemorial, and man has always tried to fight with the disease process by various methods available to them. Oral health is the reflection of our general well-being, therefore, oral health is also an essential part of the public health but which is often neglected in health care policies. The poor ability to access the health services is strongly associated with factors such as poverty, mismanagement of services, and unavailability of facilities. Access to dental services not only refers to utilization but also to the extent by which the utilization is judged as per the professional norms using five independent dimensions of availability, accessibility, accommodation, affordability and acceptability.

Affordability is determined by how easily the client can physically reach the location of the provider. Accommodation refers the extent to which the provider's operation is organized in ways that meets the preferences and constraints of the client. And finally, acceptability describes the extent to which the client is comfortable with the more immutable characteristics of the provider, and vice versa. These characteristics include the age, gender, social class, and ethnicity of the client and provider, as well as the type of coverage and diagnosis of the client.

The World Health Organization has identified the inverse care law as one of the common shortcomings of health care delivery which suggests that the availability of good health care tends to vary inversely with the need for the same in the population that is being catered. India, being one of the biggest democracies in the world, with a population of more than a billion is rapidly developing and making great progress in information technology, finance and living standards. In spite of these, it is very discouraging that very few people believe in regular dental care. Greater Noida is one of the emerging township in western Uttar Pradesh which is still under development. It has mixed culture of population and the utilization of dental services is
very low. Aim of the present study was to assess the
dental services utilization among population of Greater
Noida using Five A’s model.

Objectives:
1. To assess the oral health care delivery system using 5
A’s model.
2. To assess the dental services utilization among
population using 5 A’s model.

MATERIALS AND METHOD
The study was conducted in Dental College in Greater
Noida. Ethical clearance was taken from the
Institutional Review Board before starting the study.
Verbal consent was taken from the individuals who
were willing to participate in the study. A Pilot study
was conducted on 20 subjects to check the feasibility of
the study and validity of questionnaire was also
checked. This cross-sectional study was carried out on
the 200 subjects using convenient sampling on the
patients visiting dental OPD who met the following
inclusion and exclusion criteria:

Inclusion Criteria:
• Patients attending dental college and hospital were
included in the study.
• Subjects willing to participate.

Exclusion Criteria
• Subjects who were uncooperative.
• Subjects hiding the facts regarding their income,
education and occupation were excluded from
study.
• Those who did not give verbal consent were
excluded from the study.

Scheduling: The average time for the each study
subject was approximately 20-25 minutes. The entire
study was carried out over the period of two months.

Data Collection: A self-administered structured
questionnaire in English and Hindi language was used.
The data for the study was recorded on pretested
questionnaire (Moosazadeh M) by personal face to face
interview of the study subjects by a single interviewer.
Questionnaire included general information regarding
socio-demographic characteristic of the study subjects
including name, age, gender, income, occupation,
education, number of family members. It also included
view about general and dental health, attitude
regarding family dental health, monthly budget for
dental health, dental attendance pattern, main reason
for visit, treatment received, experience with previous
dental visit and attitude towards dental treatment and
preferred place for dental service utilization, cost of
dental treatment.

Statistical Analysis: Data was entered in the Microsoft
excel sheet and analysed using SPSS (version 20.0).
Descriptive methods and analytical tests (chi square
test and multivariate linear regression models) were
used. Chi square test was applied to analyse the factors
for availability, accessibility, accommodation,
affordability and acceptability of dental services.
Multivariate Analysis of demographic factors with
affordability and overall level of access was done. p
value of 0.05 was considered to be statistically
significant.

RESULTS
Out of total 200 study subjects, 140 were males (70%) and
60 were females (30%). 83% of the study population
lived in peri urban area of Greater Noida. It was found
in the study that 31.5% of the subjects were illiterate
whereas 17% were having high school certificate and
only 11.5% were graduate or postgraduate (Table 1).

It was found that 64.3% of males had insurance or
health scheme where as 43% females had insurance or
health scheme which was found to be highly significant
(Table 2).

It was seen in the study that 48.6% males and 30.0%
females had got no treatment due to high cost which
was found to be highly statistically significant. It was
also found that the 17.1% of the males refused for dental
prosthesis due to high cost where as 16.1% females
refused dental prosthesis due to high cost(Table 3).

It was found that affordability to dental services was
significantly higher among males living in urban areas
and who had done graduation or higher degree with
monthly income level between INR 31,591-47,262. While
availability was significantly associated with location of
residence, education status. It was seen that
Accessibility was significantly associated with location of
residence, education status and monthly income of
the study population. Accommodation was seen
significantly associated with location and education
and whereas acceptability was also significantly
associated with location of residence, education status
and monthly income of the study population(Table 4).
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| Variable                  | n   | %   |
|--------------------------|-----|-----|
| Gender                   |     |     |
| Male                     | 140 | 70.0|
| Female                   | 60  | 30.0|
| Location                 |     |     |
| Urban                    | 34  | 17.0|
| Periurban                | 166 | 83.0|
| Education                |     |     |
| Profession or Honours    | 22  | 11.0|
| Graduate or post graduate| 23  | 11.5|
| Intermediate or post high school dip | 24 | 12.0|
| High school certificate  | 34  | 17.0|
| Middle school certificate| 20  | 10.0|
| Primary school certificate| 14 | 7.0 |
| Illiterate               | 63  | 31.5|
| Income (INR)             |     |     |
| >126,360                 | 2   | 1   |
| 63,182-126,356           | 61  | 30.5|
| 47,266-63,178            | 10  | 5   |
| 31,591-47,262            | 38  | 19  |
| 18,933-31,589            | 45  | 22.5|
| 6327-18,949              | 38  | 19  |
| ≤6323                    | 6   | 3   |

**Table 1. Demographic Characteristics of Study Subjects**

| Yes | No | p value |
|-----|----|---------|
| MALE|    |         |
| 90  | 50 | 0.001   |
| 64.3%| 35.7%|** (Significant)**|
| FEMALE|    |         |
| 26  | 34 |         |
| 43.3%| 56.7%|         |

**Table 2. Percentage of subjects with Insurance or Health Scheme**

Mean level of access to dental services in the study population was found to be 60.3. Corresponding figures for affordability, availability, accessibility, accommodation and acceptability were 55.2 ± 12.1, 57.1 ± 12.8, 60.75 ± 14.7, 61.75 ± 8.7, 58.65 ± 11.4 respectively.

**DISCUSSION**

Present study indicated that the access to dental services was not at a promising status. The same was true for each of five components of access as described by 5 A’s model. The analysis also indicated that the acceptability of dental services was related to education level of participants which was in accordance with study done by Moosazaadeh M et al.\(^2\), Davidson and Anderson\(^3\), Bhushan P\(^1\) who indicated that education was significantly associated with use of dental services among populations. Availability dimension received (57.1). This indicates that the people believed there were not enough resources, to meet their needs which is not in accordance with study done by Moosazaadeh M et al.\(^2\), Ravindranth NS et al.\(^6\). Accessibility dimension received (60.75) indicates geographic accessibility which refers to easiness of patient’s physical access to the providers location which was in accordance with the study done by Moosazaadeh M et al.\(^2\). Affordability dimension of access received (55.2) indicates that for a significant number of studied people inability to pay for dental services was an obstacle in front of using dental services which was in line with the study done by Moosazaadeh M et al.\(^2\), Casey et al.\(^7\) and Wallace BB et al.\(^8\) who also found that inability to pay the cost of dental care contribute to lower use of dental services. The accommodation of dental services is appropriate. It means that the dentists working hours and way of organizing service providers is acceptable for service recipients which was in accordance with the study done by Moosazaadeh Met al.\(^2\) and not in accordance with Ravindranath NS\(^6\) who found negative attitude towards dentist’s waiting time.

**CONCLUSION**

According to the results of our study, the level of access to dental care services is not very good with family income, location and level of education being the determinants of this access. The major limitation of our study was that population of Greater Noida is mainly the rural population where the people are either illiterate or have only basic education, therefore more extensive studies needs to be conducted to have proper...
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### Table 3. Dental Services Refused due to High Cost of Treatment

| FILLING | DENTAL PROSTHESES | TOOTH EXTRACTION | SURGICAL SERVICES | GUM INFECTION | NO TREATMENT | MORE THAN ONE | P VALUE |
|---------|--------------------|------------------|-------------------|---------------|--------------|---------------|---------|
| MALES   | 0                  | 24               | 6                 | 2             | 0            | 68            | 40      |
|         | .0%                | 17.1%            | 4.3%              | 1.4%          | .0%          | 48.6%         | 28.6%   |
| FEMALES | 4                  | 10               | 6                 | 4             | 6            | 18            | 12      |
|         | 6.7%               | 16.7%            | 10.0%             | 6.7%          | 10.0%        | 30.0%         | 20.0%   |

### Table 4. Status of Access Varieties Aspects to Dental services by Variables Studied

| AFFORDABILITY | AVAILABILITY | ACCESSIBILITY | ACCOMMODATION | ACCEPTABILITY | TOTAL LEVEL OF ACCESS |
|---------------|--------------|---------------|---------------|---------------|-----------------------|
| %             | P value      | %             | P value       | %             | P value               | %             | P value |
| GENDER        | Male         | Female        |               |               |                       |               |         |
|               | 59.2         | 51.2          | 0.02          | 57.9          | 0.871                 | 61.4          | 0.764   | 59.7    | 0.431   | 60.3    | 0.078   |
| LOCATION      | Urban        | Periurban     |               |               |                       |               |         |         |         |         |         |
|               | 60.7         | 52.1          | 0.001         | 68.3          | 0.001                 | 74.2          | 0.001   | 59.4    | 0.001   | 67.5    | 0.001   |
| EDUCATION     | Graduate and Higher |           |               |               |                       |               |         |         |         |         |         |
|               | 67.3         | 64.2          | 0.001         | 66.7          | 0.001                 | 65.1          | 0.001   | 64.1    | 0.001   | 63.3    | 0.001   |
|               | Inter-mediate |               |               |               |                       |               |         |         |         |         |         |
|               | 64.2         | 59.2          | 0.001         | 65.2          | 0.001                 | 62.3          | 0.001   | 63.7    | 0.001   | 62.5    | 0.001   |
|               | High School  |               |               |               |                       |               |         |         |         |         |         |
|               | 53.6         | 59.2          | 0.001         | 54.7          | 0.001                 | 54.2          | 0.001   | 56.3    | 0.001   | 58.3    | 0.001   |
|               | Primary      |               |               |               |                       |               |         |         |         |         |         |
|               | 49.5         | 49.5          | 0.001         | 48.7          | 0.001                 | 50.3          | 0.001   | 52.4    | 0.001   | 55.2    | 0.001   |
|               | Illiterate   |               |               |               |                       |               |         |         |         |         |         |
|               | 63.5         | 63.5          | 0.001         | 63.5          | 0.001                 | 63.5          | 0.001   | 63.5    | 0.001   | 63.5    | 0.001   |
| INCOME (In INR) | ≥126,360 | 52.5          | 0.001         | 53.4          | 0.001                 | 54.3          | 0.001   | 60.5    | 0.001   | 70.4    | 0.001   |
|               | 62,182-126,356 | 56.3          | 0.001         | 52.2          | 0.001                 | 57.8          | 0.001   | 60.5    | 0.001   | 70.4    | 0.001   |
|               | 47,266-63,178 | 59.8          | 0.001         | 55.4          |                       | 64.1          | 0.001   | 59      | 0.001   | 69.3    | 0.001   |
|               | 31,591-47,262 | 66.3          | 0.001         | 51.2          | 0.001                 | 62.0          | 0.001   | 57.6    | 0.001   | 72      | 0.001   |
|               | 18,933-31,589 | 65.2          | 0.001         | 50.2          |                       | 60.2          | 0.001   | 71.4    | 0.001   | 64.7    | 0.001   |
|               | 6,327-18,949 | 63.5          | 0.001         | 59.5          |                       | 60.2          | 0.001   | 59.8    | 0.001   | 70.8    | 0.001   |
|               | ≤6323        | 61.2          | 0.001         | 48.3          |                       | 57.6          | 0.001   | 55.7    | 0.001   | 68.0    | 0.001   |

*Table 3.* Dental Services Refused due to High Cost of Treatment

*Table 4.* Status of Access Varieties Aspects to Dental services by Variables Studied
understanding of the utilization of dental services by the population.

RECOMMENDATIONS
1. The dental community should be sensitive to patients’ occupations as a marker for limited dental care access and unmet dental care needs.
2. State funding should be earmarked for the development of oral health care services targeting worker groups (and their families) reporting the highest levels of unmet dental care needs and significant barriers to receiving dental care.

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