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Original Research Article

Recent trends in dental visits among socially insured group to a referral centre– A retrospective study

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ABSTRACT

Background: A retrospective analysis was undertaken to assess the recent trends in dental visits among socially insured group to a referral centre.

Materials and Methods: The data was collected retrospectively from records and dental database of Employee state insurance unit of a referral centre in Karnataka from February 20, 2018 to March 10, 2018. A total of 558 study subjects' data was recorded. Depending upon the nature of the data, the statistical tests were chosen according to SPSS. P value 0.005 was considered significant.

Results: The minimum age was 4 and maximum was 75 with a mean and standard deviation of 32.27±12.90 years. There were 311(55.7%) males and 247(44.3%) females. A total of 321 (57.5%) of study subjects were self -benefited and 237(42.5%) were dependent of the employee. Out of the total 558 study subject's majority 126 (22.6%) were referred for chronic apical periodontitis followed by 109(19.5%). Most of the subjects 188(33.7%) were treated for root canal. The minimum cost of the treatment received by the beneficiary was Rs. 240 and maximum was Rs.18055 with mean and standard deviation of Rs.2842.25±1939.8 respectively for the study subjects There was a strong significant association seen with cost and diagnosis of all dental diseases p>0.000 and cost and treatment of diseases p>0.000.

Conclusion: The insurance coverage was beneficial to the subjects as it has reduced the burden of cost borne by the individual alone. Furthermore, it has made the treatment easily accessible, encouraging individuals to take treatment at the early stage, thus reducing the inequality

1. Introduction

The starting point for any health sector reform is the existing situation.[1] According to the WorldHealth Report 2000, the four functions of a health system are: stewardship, resource generation, financing, and service provision. Health-care financing consists of three sub-functions: revenue collection, pooling and purchasing of (paying for) services.[2] Social insurance is a way of financing health care and is the main feature of the Bismarckian model for health-care management.[3] It is a prominent aspect of the Indian health system.

Over the last 50 years, India has achieved a lot in terms of health improvement. But still India is way behind many fast-developing countries. In case of government funded health care system, the quality and access of services has always remained major concern. A very rapidly growing private health market has developed in India. This private sector bridges most of the gaps between what government offers and what people need. Dental care is a very important part of our modern life today. Having a great smile can in-still confidence, self-pride and a feeling of

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accomplishment.[4] Unlike most western countries, specific dental insurance plans are not common in India. In India, oral health is normally integrated with the general health insurance schemes.

Social security for the ordinary working citizens of any civilization is a concept that is as old as civilized society. The promulgation of employee's State Insurance Act (ESI Act) by parliament was the first major legislation on social security of workers of independent India. Employee's state insurance corporation (ESIC) was established in 1948 as an autonomous body under the Ministry of Labour and Employment, Government of India. It is the largest social security organisation in the whole of Asia.[5] The Act currently covers a total beneficiary population of 33.6 million (8.5% of the workforce).[5] The ESI scheme is mainly financed by contributions raised from employees covered under the scheme and their employers as fixed a percentage of wages. The rate of employees' contribution is 1.75% of wages and the employer's contribution is 4.75% of wages. The scheme's uniqueness lies in the fact that the insured person and their family get health insurance, including dental insurance, for a single contribution. The health-care benefit is provided as per requirement of the patient and not as per the amount of contribution he or she made towards ESI.[5]

According to the results of the National Sample Survey conducted in 2012 only 8.5% of the total work force is employed in the formal or organised sector.[6] The ESI Act applies to any premises where 10 or more persons are employed. Employees of units and establishments covered drawing wages up to Rs 15,000/month (approximately ≤2US$75) come under the purview of the ESI Act, 1948, for multidimensional social security benefits.[6,7] Ministry of labour and employment under govt of India has extended the ESI scheme to entire Karnataka from September 1, 2016.

Access to dental care is closely associated with income, education and insurance.[8] A significant belief held is that poor oral health behaviour is the reason why people on low incomes experience poor oral health. However, findings suggest that people from disadvantaged groups are equally inclined to practice oral health self-care as those from more affluent groups.[9] The majority of the studies based on the insurance coverage on oral health-care services have been conducted in developed countries like the USA and Canada. Such studies are rare in developing countries.

A previous retrospective study by Rebekah F et al[10] where data was analysed from the IBM Watson Medicaid Market scan data from 2013 to 2017, a nationally representative dental and medical claims database from 13 deidentifed states in the United States. Among patients who returned to the dentists following an emergency visit, 43% returned for more definitive dental treatment, most within 30 days. Another research brief by Gupta N et al[11] the fees for the most common endodontic prosthodontics, periodontal and oral surgery procedures have increased from 2005 to 2014; however, the increase in reimbursement rates from third-party payers is not at par with the increase in fees. Further, the difference in fees charged and the reimbursement rate observed appears to be increasing over time which significantly influenced dentist incomes.

Although insurance affects the probability of visiting a dentist, it is unclear how it affects the frequency of use of such services. Owing to a lack of epidemiological studies there is a need for vital information about the oral health status of the workers insured under the national social security scheme. Studying the existing situation may be a basic step in order to make informed decisions and use this period as an opportunity to improve the supportive role of social insurance for dental care. With this background the present study a retrospective analysis was undertaken to assess the recent trends in dental visits among socially insured group to a referral centre.

2. Aims and Objectives

1. To assess the recent trends in dental visits among Socially insured group to a referral centre.
2. To assess the effectiveness of social insurance in using dental services.

3. Materials and Methods

The present study is a retrospective analysis to assess the recent trends in dental visits among socially insured group to a referral centre.

3.1. Study design

A retrospective study.

3.2. Study population

The study population consisted of patients with benefit of social insurance attending the Employee state insurance unit for dental treatment.

3.3. Ethical permission

Permission was obtained from the Principal and Head of the department of ESI unit of the referral centre before collecting the data from records.

3.4. Sample size and sampling technique

Through convenience sampling a referral centre was selected. For this retrospective study the data transferred in dental records and computer (dental database) in the past three years (2015-2017) was collected from February20 2018 to March 10, 2018 and analysed. A total of 558 study subject's data was recorded.

3.5. Data collection

All the subjects visiting received an initial dental examination at the beginning in a referral centre by a dentist and then were referred for respective treatment. The data regarding the subject age, gender, year, centre of referral, beneficiary, diagnosis, treatment needed and cost of the treatment were entered in two records and later transferred into computer.

3.6. Statistical analysis

Data obtained was compiled systematically in Microsoft Excel 2013 spreadsheet and a master table was prepared. The data set was subdivided and distributed meaningfully. The data were proof read, and later presented in the form of graphs and tables. Statistical analyses were performed using a personal computer with Statistical Package for Social Sciences software (SPSS version 24). Data comparison was done by applying specific statistical tests to find out the statistical significance of the obtained results.

Depending upon the nature of the data, the statistical tests were chosen.

Descriptive statistics were performed for age, sex, referred centre, year, beneficiary, diagnosis, treatment received, and cost of treatment to obtain frequencies and percentages.

The influence of cost on age, sex, referred centre, year, beneficiary, diagnosis, treatment received was compared using Chi-square test. coGuide version V.1.0 was used for statistical analysis. [12]

4. Results

A total of 558 study subjects were selected for final analysis. The minimum age was 4 and maximum was 75 with a mean and standard deviation of 32.27±12.90 years. There were 311(55.7%) males and 247(44.3%) females. Among the total 558 study subjects in 2015 a total of 108(19.4%) were referred, in 2016 a total of 203(36.4%) were referred and in 2017 a total of 247(44.3%) were referred respectively. A total of 321 (57.5%) of study subjects were self-benefited and 237(42.5%) were dependent of the employee (Table 1). Out of the total 558 study subjects majority, 126(22.6%) were referred for chronic apical periodontitis followed by 109(19.5%) for acute apical periodintits, 34(6.1%) were referred for dental caries,44(7.9%) for abscess, 71(12.7%) for missing teeth respectively. (Figure 1)

Out of the total 558 study subject's majority, 188(33.7%) received root canal, 66(11.8%) received fixed partial dentures, 126(22.6%) of them received more than two treatments 33(5.9%) received extraction, 25(4.5%) received removable partial dentures, 66(11.8%) received fixed partial dentures, 39(7%) of them received malocclusion corrections and 11(2%) of them received any surgical treatments respectively. (Figure 2)

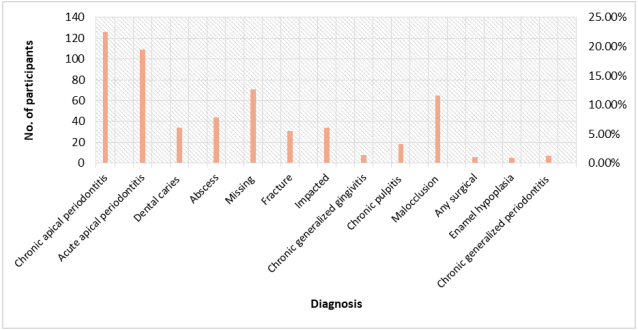

Fig. 1: Distribution of study population according to diagnosis of dental disease

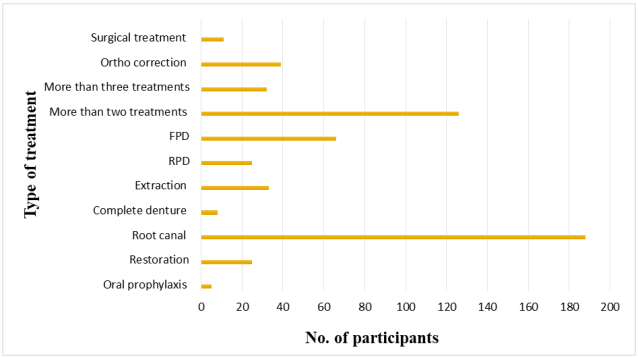

Fig. 2: Distribution of study population according to treatment received

The minimum cost of the treatment received by the beneficiary was Rs. 240 and maximum was Rs.18055 with mean and standard deviation of Rs.2842.25±1939.8 respectively for the study subjects. (Table 3) There was no association seen with cost on beneficiary and referred centre with p>0.205 and p>0.877. (Table 2) There was a strong significant association seen with cost and diagnosis of all dental diseases p>0.000 (Table 3). There was a strong significant association seen with cost and treatment of diseases p>0.000. (Table 4)

5. Discussion

The majority of the studies based on the insurance coverage on oral health-care services have been conducted in developed countries like the USA and Canada. Such studies are rare in developing countries. This is the first study of its kind in India, assessing the recent trends in dental visiting among socially insured group to a referral centre. The minimum age was 4 and maximum was 75 with a mean and standard deviation of 32.27±12.90 years. There were 311(55.7%) males and 247(44.3%) females. A total of 321 (57.5%) of study subjects were self -benefited and 237(42.5%) were dependent of the employee. Out of the total 558 study subjects majority 126 (22.6%) were referred

Table 1: Influence of cost with age, sex, year, beneficiary and centre using chi-square test

Variable (n)	Mean ± SD(rupees)	P -value
Age(n)		
4-24 (160)	3162.75±1588.42	0.104
24-44 (294)	2704.96±1949.67	0.104
44-64 (99)	2731.16±2370.14	0.104
64-84 (5)	2859.00± 1532.34	0.104
Gender (n)		
Male (311)	2632.78 ±1654.33	0.005
Female (247)	3106.00 ± 2224.06	0.005
Year (n)		
2015 (108)	3331.95± 2496.81	0.004
2016 (203)	2606.17 ± 1536.97	0.004
2017 (247)	2868.97 ± 2000.10	0.004
Self/ dependent(n)		
Self (321)	2752 ± 1975.055	0.205
Dependent (237)	2963 ± 1888.58	0.205

Table 2: Influence of cost with diagnosis using chi-square test

Variable (n)	Mean ± SD(rupees)	P -value
Chronic apical periodontitis (126)	2770.12±1221.06	<0.001
Acute apical periodontitis (109)	2913.99± 1460.10	<0.001
Dental caries (34)	1214.41±1163.93	<0.001
Abscess (44)	2887.75±2810.61	<0.001
Missing (71)	2767.11±2161.53	<0.001
Fracture (31)	3898.06±2249.92	<0.001
Impacted (34)	1177.82±1082.59	<0.001
Chronic generalized gingivitis (8)	1842.50±1715.69	<0.001
Chronic generalized periodontitis (18)	2934.17±1527.75	<0.001
Malocclusion (65)	4061.69±1206.64	<0.001
Surgical (6)	5524.17±4266.6	<0.001
Enamel hypoplasia (5)	1080.0±762	<0.001
Acute generalized periodontitis(7)	3357.86±1966	<0.001

Table 3: Distribution of study population according to the cost of treatment

Variables	No. of subjects	Minimum	Maximum	Mean ± SD
Cost	558	240	18055	2842.25±1939.8

Table 4: Influence of cost with treatment received using chi-square test

Variable (n)	Mean ± SD(rupees)	P -value
Scaling (5)	546±13.41	<0.001
Restoration (25)	681±341.19	<0.001
Root canal treatment (188)	2505.09±1433.47	<0.001
Complete denture (8)	2043.75±10.60	<0.001
Extraction (33)	518.48±177.36	<0.001
Removal partial denture (25)	756±224.74	<0.001
Fixed partial denture (66)	4437.65±1462.93	<0.001
>2 treatments (126)	3292.38±1808.08	<0.001
>3 treatments (32)	2934.17±1527.75	<0.001
Surgical(11)	4644.41±1935.32	<0.001
Other (39)	3653.33±992.17	<0.001

for chronic apical periodontitis followed by 109(19.5%). Most of the subjects 188(33.7%) were treated for root canal. The minimum cost of the treatment received by the beneficiary was Rs. 240 and maximum was Rs.18055 with mean and standard deviation of Rs.2842.25±1939.8 respectively for the study subjects. There was a strong significant association seen with cost and diagnosis of all dental diseases p>0.000 and cost and treatment of diseases p>0.000.

In this study, insured individuals were more likely to report to visit. This finding is consistent with earlier studies such as a Canadian study [13] that found that dental insurance significantly increased the probability of an individual receiving any dental care over a one-year period. Earlier findings suggested that this effect was due to a reduction in the price paid for dental services, rather than a decision by individuals with poor oral health to selectively purchase dental insurance. [14]

There are two variables in terms of demographic factors: age and gender. Only gender had statistically significant association (p< 0.004) and it was male who visited for oral care more than females. This finding is in contrast to other studies Benjakul P and Chanaya C et al. [15]

Leungputtarawang P et al [16] where females visited more than males. Different from other studies by Chanaya C et al [15] and Smith L et al [17] age in this study seemed not associated with use of dental services. In this study 70% of the subjects were below 60 years whereas another majority was below 24 years (30%). The reason for this is young and adults being more oriented towards their oral health care and the benefit of insurance was with these age groups as 60 years is the working age limit in government sector. This finding was in comparison to a studies conducted in Finland by Ahlberg J et al [18] among male industrial workers aged 38–65 years which revealed that although subjects had similar attitudes towards the importance of regular dental care, the probability of a dental visit was positively associated with access to an employer provided dental benefit schemeand a Swedish National study conducted by Renvert S et al [19] among 1,147 subjects aged 60 years that noted annual dental care received by 82% of dentate individuals.

In the present study there was a strong statistical significant association seen (p>0.005) with respect to year as the number of people visiting a dentist increased each year from 19.4% in 2015 to 44.3% in 2017. This can be associated with employer provided social security scheme However, with the recruitment of dentists and recent opening of dental schools and hospitals under the insurance scheme the visit for dental care is likely to increase among the socially insured patients in the region. 75% of the study subjects were diagnosed with dental caries and periodontal diseases reason being improper tooth brushing, habits related to tobacco and alcohol, lack of awareness etc. which was not considered in the present study.

A highly significant association was seen between diagnosis of dental disease and type of treatment received with cost (p.0.000) of the treatment. It was observed that majority of the study subjects were having dental caries and periodontal diseases which is in comparison to the study conducted by Singh et al. [20] Those insurance health systems with treatment -oriented features and an obligation to regular dental check-ups have resulted into higher rates of check-ups. [21] The rates of checkups in the present study certainly reflect the nature of the health delivery system. Unfortunately, India has a treatment-oriented health care system where patients usually make a dental visit when they have trouble with their teeth or gums. The policies of either public or private insurance include no obligation to attend regular dental check-ups. In our study, having a social insurance had a strong impact on attendance at dental checkups. This is in line with findings from countries with predominantly private insurance schemes and high rates of dental check-ups. [22]

In India, social insurance is employer-sponsored, and dental services are offered to employees and their families as fringe benefits. In the present study fewer tooth extractions may reflect their better options for treatment, availability, and accessibility of dental services. This is also influenced by the level of education, income, attitude, and beliefs of an individual which should be taken into consideration in further studies, as it may overestimate the true effect of insurance on the use of dental services. It has also been shown that having dental insurance increased the likelihood of obtaining regular dental care, such as regular check-up in the referral centre and then referring them for treatment. This finding was in comparison to a study Australian Research Centre for Population Oral Health. [23]

Thus, it is possible that insured individuals are more likely to maintain sound oral health, which would reduce the likelihood of them obtaining dental care for the purpose of pain relief only. To increase the reliability and generalizability of the present findings of the study further studies should be conducted by directly interviewing the insured group and dentists who are providing services to know the pros and cons of the social insurance and necessary improvements to be made to make it available to all sectors of the community.

6. Limitations

A potential limitation of this study was that the data was collected retrospectively which can lead to information bias. Other factors such as health insurance status, frequency of cleaning teeth, frequency of between-meal sugar consumption, education, tobacco and alcohol use and utilisation of dental services were not considered, which may influence their perception regarding dental care and also had a significant role in the development of dental

disease. Follow up or drop outs of the subjects was not assessed. Further, studies should be carried out comparing with other groups with and without insurance in multiple referral centres for more conclusive results.

7. Conclusion

The insurance coverage was beneficial to the subjects as it has reduced the burden of cost borne by the individual alone. Furthermore, it has made the treatment easily accessible., encouraging individuals to take treatment at the early stage, making services available for all thus reducing the inequality. The present results revealed the positive relationship between insurance and demand for dental care. Those having employee state insurance were more likely to go to check-ups despite their generally low rate found in this country with a developing oral health care system.

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The project was self-funded. No external agency had funded the project.

9. Conflict of Interests

The authors declare no conflicts of interest.

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