

TIME REQUIRED BY DENTAL POST GRADUATES AND GRADUATES FOR DIRECT PATIENT CARE IN PERIPHERAL OUTREACH CENTRE - A COMPARATIVE WORK SAMPLING ANALYSIS

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ABSTRACT

Background: The inequity of oral health services persist due to inadequate dentist to patient ratio in the peripheral areas. The possibility of management of more number of patients lies within an efficient work force, in order to render oral health services in a well-organised manner. Objectives: The research was taken up with the primary objective of determining the most time efficient manpower in a peripheral dental unit. Secondary objective was to determine the time spent in each treatment procedure in proportion to total time involved in direct patient care. Third objective, was to recommend an appropriate range of sample for further similar studies using observatory methodology in peripheral centres. Methodology: Work measurement was done for the postgraduate and the undergraduate students for the treatments performed by them in the unit. Participatory observations were made on randomly selected days, and timings were recorded using standardised stop watch. Descriptive analysis was performed for the data obtained using Statistical Package for Social Science (IBM Corp. Released 2010. IBM SPSS Statistics for Windows, Version 19.0.Armonk, NY: IBM Corp.). Results: Mean timing was found to be highest for all treatment procedures amongst graduates when compared to the postgraduates and maximum proportion of time was spent for extractions amongst all the treatments performed. Conclusion: Availability of speciality services will help the hospitals render more proficient services to the rural masses.

Key words: Health Services, Observatory study, Work sampling

INTRODUCTION

With the inadequate dentist to patient ratio in the rural areas, the dental manpower¹⁻³ is multi-skilled and renders all possible treatments in these peripheral areas. Thus, the outreach units serving the masses in these areas require the most time effective manpower that will help in efficient patient care in satellite centres.⁴ Time management is the key for efficient patient care in any hospital and is important for documentation, diagnosis, management of the treatment plan, and in carrying out the treatment procedures.⁵⁻⁷ As empirical evidence is lacking in oral health care services,

the authors decided to uptake a work sampling analysis for the dental surgeons working in a non-profitable peripheral dental centre in order to determine the most efficient manpower.⁸ Thus, the research was undertaken with the objective of determining the most time efficient work force for direct patient care for these peripheral centres. Secondary objective was to determine the time spent in each treatment procedure in proportion to total time involved in direct patient care. Third objective, was to recommend an appropriate range of sample for further similar studies in peripheral centres.

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METHODOLOGY

Ethical clearance was obtained from the institutional Ethics Committee. The study area was a peripheral outreach dental centre with average OPD of 448 patients per month. The unit of observation were the dental graduates and the postgraduate doctors working in the unit on a scheduled basis. Purpose of the research was explained to all the participants under study and informed consent was obtained from each. However, the day of observation was not disclosed to the participants in order to avoid any Hawthorne's Bias. Time involved in direct patient care was recorded using a standardised stop watch. It involved the time of preparation of the tray for direct patient care till the end of treatment. Traditional method for time measurement by a trained observer was used, as self reported measurements could have lead to, imprecise and potentially biased measurements.⁹

During procedure any time spent in the conversation with the patient was not omitted. On random days observations were made for 2 post graduates and 2 graduates over a period of one month. The element of direct patient care was considered appropriate to be under study for the peripheral centre which includes, communication with the patients, medical activities, read in patient record, other patient care and waiting for the patient. However, waiting time was not considered for the comparison of the two manpower's present in the peripheral centre. Sample size estimation for number of observations was not done as the research was first of its kind in dentistry and followed convenient sampling. In order to obtain comparable timings for different procedures, a standardisation was done for cases which were included for the observations. The protocol formed included the most frequent procedures performed in the peripheral unit. Total 117 observations were made for different procedures done for standardised patients. 28 observations were made for extraction of teeth, 19 for the access opening of posterior molars, 15 for biomechanical preparation, 17 for obturation and 11 for complete oral prophylaxis for patients with less than 1/3rd of the tooth covered with stains and calculus and 27 observations were recorded for Class I and Class II cavity

restorations. SPSS (statistical package for the Social Sciences) version 19 was used for descriptive data analysis. Results were obtained considering the binomial distribution of work sampling analysis. The proportion of time utilised for each procedure in the total direct patient care time was used, to calculate the number of observations for each treatment procedure using the formula below, in order to give ideal timings and observations for further similar research in peripheral dental hospitals. (ISE 531 - Work sampling)

Formula used

Estimate of time spent in particular treatment procedure = p

Absolute accuracy desired (Aa) = 5%

Confidence in results desired = 95% (Z=1.96)

Number of observations = N

Z is score from normal distribution

(distance from mean, in standard deviation units)

Determine: $N = z^2 p(1-p)/Aa^2$

RESULTS

Mean timings were found to be highest for all treatment procedures amongst graduates when compared to the postgraduates. (Table1) Thus, the postgraduate doctors are efficient in saving time and make the unit work more efficiently, leading to decreased waiting hours for the patient and enhancing the patient experience. The complete direct patient care involved 3187.989 minutes/53 hours during the total observation period. (Figure 1) Based on the proportion of time obtained, number of observations required for observing these treatment procedures, in a rural set up, were computed for further research. Due to sample variation that may arise because of different sampling population, confidence intervals were calculated for each proportion of time in order to give a range according to which the number of observations can vary in each peripheral study unit (Table2).

The mean time of extraction for mobile teeth was 17.19 min while for other conditions considering extractions was 34.24 minutes revealing an expert need for latter cases of

Table 1. Timings of treatment procedures for postgraduates and graduates

Procedure	Average for Post Graduates (Time in min) Mean ± S.D	Average for Graduates (Time in min) Mean + S.D	Difference in Manpower avg.
Extractions	19.56 ±10.469;SE=2.617	22.50±15.571;SE=4.495	-2.94
Access Opening	26.15±8.915;SE=2.473	28.50±21.659;SE=8.842	-2.35
Biomechanical Preparation	34.60±16.147;SE=5.106	59.00±28.784;SE=12.872	-24.4
Obturation	34.18±9.918;SE=2.990	42.67±22.042;SE=8.999	-8.49
Oral Prophylaxis	15.25±7.136;SE=3.568	25.00±7.43;SE=3.033	-9.75
Restorations	18.92±10.595;SE=2.938	25.36±10.924;SE=2.919	-6.44

Table 2. Number of observations required for further research in peripheral dental centre for each treatment procedure

Treatment Procedure	Proportion of direct patient care time	p (mean),SE	Confidence Interval	Number of Observations $N = z^2p(1-p)/Aa^2$
Extraction	18%	P=20.8393, SE=2.39170	CI=20.83±2.34	230
Access opening	16%	P=26.7311, SE=3.11673	CI= 26.73±3.04	206
Biomechanical Preparation	20.14%	P=42.8207, SE=6.02745	CI= 42.82±5.89	247
Obturation	20.10%	P=37.2353, SE=3.66507	CI= 37.23±3.58	247
Oral Prophylaxis	6.62%	P=21.1150, SE=2.71150	CI= 21.11± 2.65	95
Restoration	18.93%	P=22.3026, SE=2.13557	CI= 22.30± 2.09	236

extractions. The anterior teeth due to the anatomical variation of being single rooted for most cases had lower mean timings when compared to the posterior molar teeth.

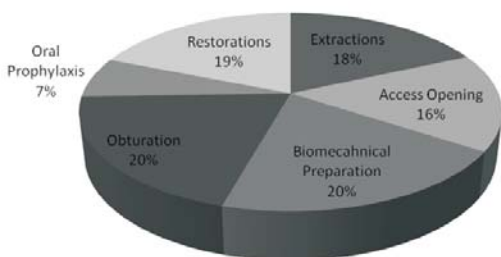


Figure 1. Proportion of time for each treatment procedure in direct patient care

DISCUSSION

Work sampling analysis is a method of obtaining information about men or machines in less time

and lower cost.¹⁰ The analysis targets, activity and delay sampling, performance sampling and work measurement. However, this research took only work measurement into account as indicated by the objectives. It was appropriate to determine, an ideal workforce in these centres as well as estimate the number of observations required for observing these treatment procedures due to the poor dentist to patient ratio in peripheral hospitals. Direct patient care was the only component considered and was adequate to meet the objectives of this research. Direct patient care is also appropriate to give ideal timings for treatment procedures in dentistry contrary to the fact that peripheral centre infrastructure is much inferior when compared to a tertiary care hospitals in turn demanding a more efficient manpower. Work sampling was ideal for work measurement as the categories of tasks performed was less in number

but this study could not overcome the limitation of work sampling as repetitive action by a participant could lead to more number of observations of a single task when compared to the others.¹¹ Maximum observations were recorded for extractions as it was the most frequent treatment procedure being performed. Secondly, many treatment procedures in the protocol could not be observed as these procedures were not given to graduates or were unequally distributed amongst the work force. Thus, procedures like crown cutting and impression making, although included in the research protocol were omitted from data analysis. Due to paucity of literature, lack of representative sample for the research was also an indentified limitation. However, this research was able to give a basis of estimating a sample for further similar empirical researches in dentistry.

CONCLUSION:

It is concluded that specialised work force is more efficient in a peripheral centre as, supporting auxiliaries are less in number and more efficient time management leads to more productive dental services by these outreach units. Similar analysis, can be conducted for estimating the appropriate work force for all peripheral government dental care centres, as the research was done for a private non-profitable dental unit. Further research with activity and delay sampling and performance index can be made use of by profitable dental hospitals working for rural masses.

REFERENCES:

1. Giordano LA, Elliott MN, Goldstein E. Development, implementation, and public reporting of the HCAHPS survey. *Med Care Res Rev* 2010; 67:27–37.
2. Suhonen R, Papastavrou E, Efstathiou G. A: Patient satisfaction as an outcome of individualised nursing care. *Scand J Caring Sci* 2012; 26:372–80.
3. Mainz J. Defining and classifying clinical indicators for quality improvement. *Int J Qual Health Care* 2003; 15:523–30.
4. Jenkinson C, Coulter A, Bruster S. Patient's experiences and satisfaction with health care: results of a questionnaire study of specific aspects of care. *Qual Saf Health Care* 2002; 11:335–9.
5. Damman OC, Hendriks M, Sixma HJ. Towards more patients centred healthcare: A new Consumer Quality Index instrument to assess patients' experiences with breast care. *Eur J Cancer* 2009; 45:1569–77.
6. Bridges J, Flatley M, Meyer J. Older people's and relatives' experiences in acute care settings: Systematic review and synthesis of qualitative studies. *Int J Nurs Stud* 2010; 47:89–107.
7. Attree M. Patients' and relatives' experiences and perspectives of 'good' and 'not so good' quality care. *J Adv Nurs* 2001; 33:456–66.
8. Christine RN. Nursing skill mix and nursing time: the roles of registered nurses and clinical nurse specialists. *Australian Journal of Advanced Nursing* 2003; 20:19-23.
9. Nickman NA, Guerrero RM, Bair JN. Self-reported work-sampling methods for evaluating pharmaceutical services. *Am J Hosp Pharm* 1990; 47:1611–7.
10. Mackieh A. Work sampling IENG 301. *Fundamentals of Work Study and Ergonomics*. Fall 2013; 22:108-12.

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