

# Awareness and Perception of Danta Bhagya Yojane among Patients and Accompanying Persons Visiting Outpatient Department of a Tertiary Dental Teaching Hospital in Bangalore City: An Exploratory Cross-sectional Survey

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## Abstract

**Background:** The free prosthodontic services provided by Danta Bhagya Yojane (DBY) in Karnataka should be utilized to treat oral disabilities due to tooth loss.

**Aim:** Evaluation of the awareness and perception regarding DBY among patients visiting a dental college and hospital in Bangalore.

**Material and Methods:** An interviewer-administered, questionnaire-based cross-sectional survey of 400 adults was carried out in the outpatient department of a dental teaching hospital, to collect data regarding their perception and awareness about the DBY.

**Results:** Most respondents ( $n = 228$ , 57.0%) were below-poverty-line card holders. The majority ( $n = 260$ , 66.2%) of respondents were unaware of DBY. Among those ( $n = 133$ , 33.8%) who were aware, some ( $n = 19$ ) had the wrong impression that fixed prosthesis such as implants, bridges, and crowns was included under DBY. Knowledge about DBY through television advertisements was reported by 15.3% ( $n = 61$ ), while 6.5% ( $n = 26$ ) were aware through the Government-issued posters put up in the reception area. Few ( $n = 22$ , 5.5%) were aware that they could avail the DBY in private dental colleges, while a majority ( $n = 105$ , 26.3%) of them thought that they could avail the scheme only in Government dental college and hospitals.

**Conclusion:** There is a need to increase sensitization programs to improve awareness and utilization of DBY.

**Key words:** Awareness, Danta Bhagya Yojane, Free dentures, Perception, Public-funded prosthetic rehabilitation

## INTRODUCTION

Edentulism, a worldwide public health problem, is a pathological condition characterized by missing teeth; it can be partial or total. Edentulism is exacerbated

when masticatory function is not restored with dental prostheses.<sup>[1]</sup> Studies have concluded that individuals with impaired masticatory ability were at risk of malnutrition due to limitations in chewing food.<sup>[2-7]</sup>

A systematic review reported that 35% adult Indian population have complete or partial tooth mortality; the overall prevalence of complete tooth mortality (loss of 32 teeth) was 10.7% and partial tooth mortality (having one or more teeth) was 58.8%; rural adults showed twice that of urban adults.<sup>[8]</sup> Significant risk association between edentulism and being poor has been reported in the literature.<sup>[9-15]</sup> With the anticipated 20% increase in

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the elderly population in India, by 2050, the challenges to provide for the oral health-care needs of the elderly must be considered in policy and action. Thirty percent of the elderly are below the poverty line (BPL) and only 28% of the elderly population is literate.<sup>[16]</sup>

Karnataka Health Department estimates that 16% of the state's population (25.92 lakh) are toothless and require dentures.<sup>[17]</sup> The potential benefits of Common Risk Factor Approach are far greater than isolated interventions.<sup>[18]</sup> On 7<sup>th</sup> of December 2014, the Ministry of Health and Karnataka State Government decided to provide free dentures to patients above 45 years of age with complete or partial tooth loss of three or more teeth and provided that they have the BPL ration cards and documents related to age proof, under the Danta Bhagya Yojane (DBY) scheme.<sup>[19]</sup> The scheme is operational in 7 District Hospitals, 2 Government Dental Colleges, and 43 Private Dental Colleges in Karnataka.<sup>[20]</sup> Although this scheme was launched in 2014 aiming to provide this service to 30,000 people from BPL families, it was reported that in 2015–2016, only 1600 people; in subsequent years, another 5,550 people; and in 5 years, only 17,000 people were benefitted.<sup>[21]</sup>

Karnataka State Government has incentivized the accredited social health activist (ASHA) workers to spread awareness about the scheme, and they will get Indian rupees 100 for every case they refer to the dental colleges.<sup>[22]</sup> The Health Department has been conducting camps to create awareness, screen, and provide dentures to the needy despite inadequate funds allocated. Furthermore, information-education-communication (IEC) strategy included publicity advertisements for the DBY through electronic mass media - television, radio, and cinema theaters and print media - pamphlets and posters. Yet, lack of awareness about the scheme and delay in disbursement of funds to dental colleges, apart from some technical glitches, are the main reasons for the slow progress of this initiative.<sup>[23]</sup>

The critical factor for the success of any health scheme is the awareness of beneficiaries about the scheme and its services. Lack of knowledge about health programs, especially those targeting vulnerable populations, is an impediment to the right to access health, a basic human right.<sup>[24]</sup> A positive association between beneficiaries' awareness and subsequent enrolment in the scheme was observed in the case of Rashtriya Swasthya Bima Yojana and Ayushman Bharat - Pradhan Mantri Jan Arogya Yojana (PM-JAY).<sup>[25]</sup> Yet, across settings and emerging schemes, limited scientific evidence is available on levels of awareness and their determinants.<sup>[25]</sup> Literature documenting the awareness levels about DBY among dental patients or the general public is scarce.<sup>[26]</sup>

Therefore, the present study was undertaken to assess the awareness and perception about the DBY among the adult patients and accompanying persons visiting the outpatient department of a dental teaching hospital which caters to a diverse patient population, including large numbers from surrounding villages of Bangalore South.

## MATERIALS AND METHODS

An exploratory descriptive and cross-sectional survey was carried out after obtaining due informed consent and institutional ethical clearance (RRDCHET/04PHD/2020) over a period of 1 month, February 2020.

The study participants were selected based on consecutive sampling, in which every subject meeting the criteria of inclusion was selected until the required sample size was achieved. The sample size of 400 for the present study was estimated based on the following formula:

$$N = \frac{Z_{(1-\alpha)}^2 \times P Q}{\delta^2}$$

The study is first of its kind and witnessed no existence of the previous literature. It considered that probability of at least 50% ( $P = 0.50$  and margin of error  $\delta = 0.05$ ) of the patients and their accompanying persons visiting the tertiary dental teaching hospital are aware of DBY.

The study also interviewed accompanying persons who were aware of the DBY and brought those unaware patients for enrolment into DBY; this enabled us to tap the intrinsic motivation similar to that of the patients seeking prosthodontic care and achieve homogenous sample with regard to awareness about DBY.

The study tool comprised of a structured closed-ended questionnaire with three separate sections comprising of sociodemographic details, perceptions and awareness of DBY, and perception about utility and benefit of DBY. The face validity was accomplished among 5 subject matter experts who scored "very good" face validity with a composite score of 3.5 out of 4, with minimal changes indicated toward the simplicity of the language. The content validity of the questionnaire was performed using Aiken's index for adequacy of the questions satisfying the objectives of the study and the Aiken's index score for all the 13 items ranged between 0.81 and 1.00. The reliability of the questionnaire was tested using the test-retest method which showed a Cronbach's alpha score of 0.86 indicating good internal consistency of the questionnaire. The study enrolled the participants based on the subjects who had

the ability to understand and answer the questionnaire, and further, it used 04 standardized and calibrated interviewers who interviewed all research subjects using the simple questionnaire format, and hence, vernacularism was not a matter of concern. Anonymity and confidentiality were maintained by not recording the names of the respondents and assigning identification numbers instead.

A descriptive analysis comprising counts and percentage was performed for all the variables. Categorical variables were compared among the different groups using the Chi-square test. A  $P < 0.05$  was considered statistically significant.

## RESULTS

### Sociodemographic Information

A total of 400 subjects took part in the survey; most ( $n = 225$ , 56%) of them were males. Nearly half ( $n = 194$ , 49%) of the respondents were aged above 40 years. More than half of the respondents (224, 56%) resided in urban areas whereas a lesser percentage (176, 44%) of them resided in the rural areas. More than a quarter of the respondents were found to be graduates ( $n = 105$ , 26.3%) and a little over a tenth ( $n = 44$ , 11%) of the respondents were found to be illiterates. A majority of the respondents, i.e. ( $n = 152$ , 38%) were found to have a monthly family income of  $<15,000$  rupees and a small percentage of them ( $n = 29$ , 7.2%) were found to have a family income of  $>50,000$  rupees.

### Perception and Awareness about the DBY

About a quarter ( $n = 100$ , 25.0%) of the respondents were persons accompanying patients. Among the rest who were patients, about a fifth ( $n = 87$ , 21.8%) had visited the hospital to replace missing teeth and more than a tenth ( $n = 51$ , 12.8%) for removal/extraction of teeth. More than half of the respondents (228, 57.0%) were BPL card holders. Majority ( $n = 268$ , 67%) of the patients reported having up to two missing teeth, less than a quarter ( $n = 95$ , 23.8%) had three or more teeth missing; less than a tenth ( $n = 36.9%$ ) had completely no teeth. A majority of the respondents ( $n = 260$ , 66.2%) had never heard about DBY; among those who had, only some ( $n = 67$ , 16.8%) were well informed about the treatment facilities covered under DBY, while less than 5% ( $n = 19$ ) were under the wrong impression that fixed prosthodontic treatments such as implants, bridges, and crowns were also included under the scheme. A very less number of respondents ( $n = 22$ , 5.5%) were aware that they could avail the scheme in private dental colleges, while a majority of them ( $n = 105$ , 26.3%) thought that they could avail the scheme only in Government dental college and hospitals [Table 1].

Most of the respondents ( $n = 61$ , 15.3%) were found to have the knowledge about the DBY through means of television advertisements; less than a tenth ( $n = 26$ , 6.5%) of the respondents knew about the scheme through the posters put up in the outpatient department of the college and a very small percentage ( $n = 2$ , 0.5%) of them were informed about the scheme by ASHA workers [Table 1]. About one-fifth ( $n = 28$ , 20.7%) of the respondents had availed the DBY. Most of the respondents who had heard about the scheme reported that they had informed others about it, while the rest of them ( $n = 66$ , 48.9%) have not shared the information of the scheme with anyone. On visiting the dental college, more than half of the respondents ( $n = 79$ , 58.5%) came to know about the DBY in the outpatient department of our college through advertisement posters and very few of them ( $n = 4$ , 3%) have heard about it through the public announcement system [Table 2].

### Perception about Utility and Benefit of (DBY)

Nearly a fifth of the participants ( $n = 77$ , 19.3%) thought that the benefits to the patient under the scheme is cost-efficient. A little more than a tenth ( $n = 50$ , 12.5%) felt the scheme enables them to avail dentures at a lower cost; a few of them ( $n = 13$ , 3.3%) perceived that the scheme enables them to improve the speech and helps them to speak better. Finally, a third of participants ( $n = 14$ , 31.8%) faced a longer waiting period between appointments during or after availing the services under this scheme and a small percentage of the respondents complained of poor quality dentures being delivered to them under this scheme [Table 2].

### Distribution of Responses by Income and Gender

Although it was not the objective of the study, the distribution of responses by income and gender revealed that a significant proportion of BPL card holders was aware of DBY (43.7%) as compared to APL card holders (21.1%) at  $P < 0.001$ . The majority of the BPL card holders (24.1%) knew about the scheme from the Electronic Mass Media as compared to other income groups (9.9%) at  $P = 0.004$ . Moreover, predominant proportion of BPL card holders (25.8%) has availed the service of this scheme for the replacement of missing teeth as compared to other income groups (7.9%) at  $P = 0.02$ . A significant proportion of 24.1% of the BPL card holders has perceived the various benefits of denture treatment under this scheme as compared to other income groups (12.8%) and the difference was statistically significant at  $P = 0.004$ .

However, no significant differences were observed in the subjects' responses to the study questionnaire the based on the gender distribution.

**Table 1: Comparison of distribution of responses for study questions by participants using Chi-square goodness of fit test**

Question	Response	n (%)	Chi-square	P-value
What is the reason for your hospital visit?	Routine checkup	27 (6.8)	97.280	<0.001*
	Replacement of missing teeth	87 (21.8)		
	Filling of decayed teeth	69 (17.3)		
	Correction of irregular teeth	16 (4.0)		
	Tooth removal	51 (12.8)		
	Painful tooth	50 (12.5)		
	Accompanying the patient	100 (25.0)		
Are you a BPL card holder?	Yes	228 (57.0)	7.840	0.005*
	No	172 (43.0)		
Number of teeth missing	1–2 teeth	268 (67.2)	218.632	<0.001*
	3 or more teeth	95 (23.8)		
	Completely no teeth	36 (9.0)		
Have you heard of DBY?	Yes	133 (33.8)	41.041	<0.001*
	No	260 (66.2)		
Treatment facilities covered under the scheme DBY as per your knowledge?	Removable partial denture	17 (4.3)		
	Complete denture	36 (9.0)		
	Both a and b	67 (16.8)		
	Fixed partial denture	8 (2.0)		
	Implant prosthesis/denture	11 (2.8)		
Where do you think the patients can avail DBY?	Government dental college and hospital	105 (26.3)		
	Community health center	31 (7.8)		
	Private dental college	22 (5.5)		
How did you come to know about the scheme DBY?	Social media	12 (3.0)		
	Television advertisement	61 (15.3)		
	Radio advertisement	11 (2.8)		
	Newspaper	18 (4.5)		
	Family and friends	15 (3.8)		
	ASHA worker	2 (0.5)		
	OPD	26 (6.5)		

DBY: Dantha Bhagya Yojane, BPL: Below poverty line, OPD: Outpatient department, ASHA: Accredited social health activist, \*Statistically highly significant

## DISCUSSION

Studies have demonstrated that public-funded prosthetic oral rehabilitation programs lead to tangible improvements in oral health-related quality of life of older individuals.<sup>[27]</sup> Very few states in India have provisioned state Government-funded oral rehabilitation measures such as free removable partial dentures and complete dentures for the elderly. The Mandahasam scheme in Kerala<sup>[28]</sup> and the DBY in Karnataka are the notable initiatives in this direction. However, it remains to be known if there is adequate awareness among the general public about such initiatives which is essential for their utilization and intended benefit to the target population. This prompted the need to explore the impact of existing awareness measures about the Karnataka state-free denture scheme DBY among patients and accompanying persons visiting a tertiary care dental college and hospital in Bengaluru city.

In this study, out of 400 respondents, one-third of them were above the age of 50 years who are the target population for this scheme. Among the patients, the majority reported having missing teeth and had varying extent of edentulousness; nearly, a quarter ( $n = 95$ , 23.8%) of respondents were found to have 3 or more teeth missing

in their oral cavity and about a tenth ( $n = 36.9\%$ ) were found to be completely edentulous [Table 1] which is in line with the prevalence reported in other studies.<sup>[8,9]</sup> More than half of the respondents ( $n = 228$ , 57.0%) were BPL card holders. The lower income group people could perhaps not afford the treatment procedures that would have saved their questionable tooth and so might have opted for extraction. Less educated people are not much aware about oral health care. Socioeconomic parameters have been reported to have direct influence on the replacement of missing teeth.<sup>[9,29]</sup>

The majority ( $n = 260$ , 66.2%) of them had never heard about DBY. Even though the government has introduced the scheme, it has not put adequate effort in creating awareness about the same.<sup>[23]</sup> The same was reflected in the study. Of those who were aware of the scheme less than a fifth ( $n = 67$ , 16.8%) were well informed about the treatment facility; <5% ( $n = 19$ ) were misinformed regarding the treatments covered under the scheme. This confusion among patients might be due to assumptions on their part that all types of tooth replacement prostheses are provided under DBY, and the lack of highlighting of the fact that fixed partial dentures and implant-supported prosthesis are not included in the DBY in the IEC

**Table 2: Comparison of distribution of responses for study questions by participants using Chi-square goodness of fit test**

Question	Response	n (%)	Chi-square	P-value
Have you availed the service of DBY for replacement of your missing teeth?	Yes	28 (20.7)	46.230	<0.001*
	No	107 (79.3)		
Have you informed about DBY to any of the following?	Family and relatives	35 (25.9)	91.481	<0.001*
	Friends	19 (14.1)		
	Domestic help	2 (1.5)		
	Other patients	13 (9.6)		
	None	66 (48.9)		
How did you come to know about DBY in this hospital?	Posters	79 (58.5)	135.333	<0.001*
	Public announcement system	4 (3.0)		
	Reception staff	13 (9.6)		
	Word of mouth	27 (20.0)		
	Informed by the dentist	12 (8.9)		
What are the benefits to the patient under DBY?	Cost efficient	77 (19.3)	8.500	0.08
	Ease of accessibility	12 (3.0)		
	Quality of work	6 (1.5)		
	Privilege of senior citizen	17 (4.3)		
	All of the above	42 (10.5)		
How does DBY help patients with missing teeth?	Improves ability to chew	42 (10.5)	8.500	0.08
	Helps to look better	22 (5.5)		
	Helps to speak better	13 (3.3)		
	Saves expenses	50 (12.5)		
	All of the above	44 (11.0)		
What are the problems faced during or after availing the service?	Documentation	3 (6.8)	8.500	0.08
	Procedural issues	11 (25.0)		
	Poor quality prosthesis	6 (13.6)		
	Longer waiting between appointments	14 (31.8)		
	None	10 (22.7)		

DBY: Dantha Bhagya Yojane, \*Statistically highly significant

campaigns. Therefore, it is important to have a disclaimer in the mass media advertisements or a footnote in the IEC posters to make it clear that expensive treatments such as fixed partial dentures and implant-supported prosthesis are not provided under this scheme.

Furthermore, respondents were largely unaware regarding where to avail the scheme. Even though according to the English daily article,<sup>[23]</sup> the government tie-up with 45 private dental colleges under the DBY scheme had been announced, and very less patients ( $n = 22$ , 5.5%) were aware that they could avail the scheme in private dental colleges. To create more awareness about the same, the main patient waiting area of the dental college hospital, entrance and exit areas of the campus, and satellite centers of the colleges can display posters or huge signage about the DBY.

Television advertisements were reported as the source of information about DBY by most participants ( $n = 61$ , 15.3%), while the Government-provided posters displayed in the outpatient department of the college were able to create awareness among only a small number of ( $n = 26$ , 6.5%) of participants. Although out of those who were aware of the scheme, only a fifth ( $n = 28$ , 20.7%) had availed services under the Danta Bhagya Yojana. About a quarter of the participants had spread the awareness of Danta Bhagya Yojana to their family and relatives while most

of them ( $n = 66$ , 48.9%) have not shared the information about the scheme with anyone. This lack of “word of mouth” publicity could be one of the reasons as to why very less number of patients have availed the service under the scheme. This could be rectified by explaining to the patient how edentulism can result in adverse effects to the body so the patient understands and values the treatment under DBY and spreads a good word resulting in more awareness about the scheme. It was also found that very less percent ( $n = 2$ , 0.5%) were referred to the college for DBY scheme by the ASHA workers even though they get an incentive of INR 100/- for each patient referred. A similar pattern was observed in the evaluation of the DBY conducted in 2018 and reported delay in payments to ASHA workers as being the problem.<sup>[26]</sup> Timely payment of incentives would motivate the ASHA workers to create awareness about the scheme.

Our study revealed that less than a fifth of the participants ( $n = 77$ , 19.3%) thought that the benefits to the patient under the scheme of DBY are cost efficient. The possible explanation might be other out-of-pocket expenses involved, travel, time away from work, and lost income, obtaining referral letter for DBY from the Government facility in their area. A study conducted in 2018 also reported that difficulty and costs in transportation, and mobility of older adults was a limitation that impacted

utilization of DBY.<sup>[26]</sup> Being a teaching dental institution, the removable partial dentures and complete dentures are very nominally priced even for non-DBY patients as compared to that in private practice. Our institution has been a part of the rural camps conducted under DBY, wherein prosthodontic services have been made available at the campsite. However, the frail elders in the local communities have verbally shared their constraints with us about accessing the services as they are too old and dependent on others. Regular conduct of such DBY dental camps in the remote areas and satellite centers of the hospitals where patients are screened and encouraged for enrollment in the DBY scheme can serve to ensure better reach of the DBY. More than a tenth ( $n = 50$ , 12.5%) of participants thought that the benefits of the DBY scheme include saved expenses, helped them to avail dentures at a lower cost and a few of them felt that the scheme enables them to improve the speech ( $n = 13$ , 3.3%) and helps them to look ( $n = 22$ , 5.5%) better. Hence, awareness campaigns need to emphasize that along with less expense and good esthetics, dentures provided under DBY also improve one's ability to chew, thereby improving the general health of the patient. Evidence to support including this content in the IEC is available from a meta-analysis that showed that poor nutritional status was associated with lower number of pairs of teeth/functional teeth units.<sup>[7]</sup>

Some of the participants in this study ( $n = 14$ , 31.8%) complained of facing a longer waiting period between appointments during or after availing the services under this scheme and a small percentage of the respondents complained of poor quality dentures being delivered to them under this scheme. Delays in seeking dental care might have led to increased ridge resorption affecting denture fit. However, to reduce the waiting period between appointments, the DBY can support the institutions in creating a separate team of dentists and laboratory technicians dedicated to treat patients under the scheme.

Considering that this scheme continues to provide free RPDs and CDs in Karnataka, an effective IEC strategy like that utilized for the PM-JAY should be developed wherein eligible BPL card holders can be informed of the facilities that can be availed under DBY. Although this study was conducted in only one institution, it collected information from a good mix of rural and urban patients and provides valuable baseline data.

## CONCLUSION

This study points to a lack of awareness and utilization of this unique scheme DBY among potential beneficiaries.

This study will be beneficial in planning sensitization programs and improving the ripple effect.

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