Level of Implementation of KAYAKALP in PHCs of Karnataka and its Impact

Rajarama K.E.T

C. N. Noolvi

Population Research Centre

JSS Institute of Economic Research

Dharwad, Karnataka

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1. Introduction

In India, although the non-communicable diseases are increasing, communicable illness are prevailing to a considerable extent which are mainly due to poor hygiene and sanitation practice followed by the individuals as well as the organizations. Majority of communicable diseases can be averted by practicing good personal and environmental hygiene. It is very crucial to maintain hygiene and cleanliness in health facilities as 15 percent of hospital waste including bio-medical waste (BMW) pose health risk to not only the staffs of the hospitals but also the patients, visitors and the environment (WHO, 2016). Waste generated in the health facilities may contain various microbial flora which requires adequate cleaning to prevent the spread of infections. The gross generation of bio-medical waste in India is 4, 05,702 kilogram per day of which only half is disposed properly (Dhruv et. al. 2014). The study conducted on Bio-Medical Waste (BMW) Management points out that the majority of staffs of the health facilities are not aware of scientific methods of segregation of BMW (Indupalli 2015).

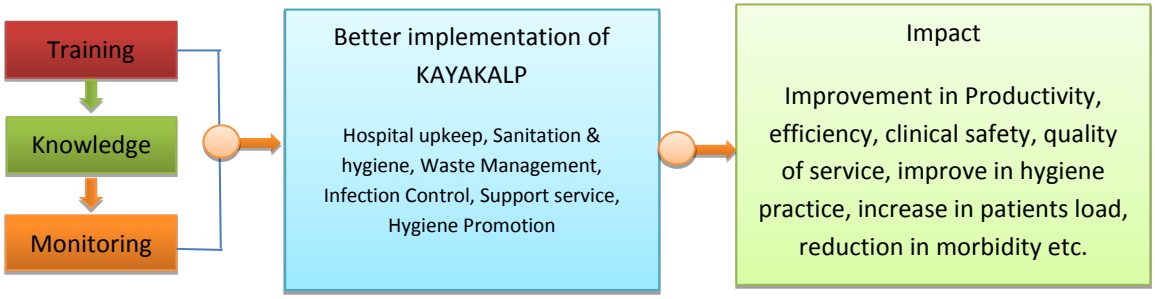
The Government of India has launched Swachh Bharat Abhiyaan (SBA) on 2nd October 2014 in order to maintain cleanliness in public places. With a view to keep the public health facilities clean and hygiene, KAYAKALP was introduced in 15th May 2015 under SBA. The objective of the programme is to encourage hygiene, cleanliness and infection control practices and sustain the same in the public health facilities through recognizing and awarding the best performing government health institutions and develop the culture of ongoing assessment. It also intends to link the improvement in the hygiene and cleanliness practice to positive improvement in the health indicators. To meet the objectives of the programme, committees at different levels are formed. The hospital level committee is supposed to implement the programme in the hospital as per the protocol and take stock of the work done once in three months and also to take measures to fill the gaps in implementation of the programme. Level of implementation of the programme will be assessed by the same committee by assigning marks to each set of indicators at the beginning of the year. Based on the hospital level committee's score, Peer assessment will be done

for the facilities which scores more than 70 percent in the facility level assessment. If the facility gets 70 percent or more score in the peer assessment, such facilities will be nominated to the state for the best award. The State Quality Assurance Committee may ask the district committee to review such health institutions for the award. The winning facility would get cash prize and a certificate.

1.1 Conceptual Framework

Based on the KAYAKALP guideline the following Conceptual Framework has been developed (Figure 1). In this Conceptual Framework, knowledge/training and monitoring of the programme are the important factors for effective implementation of the KAYAKALP programme. A comprehensive training (theory & practical) is required for all the hospital staffs

Figure -1: Conceptual Framework



for effective implementation of the programme. Further, better implementation also depends on the level of understanding of the staffs. Therefore, it is important to assess the level of knowledge of staffs to ensure uniform implementation of the programme. Besides, commitment of the staffs also matters for effective implementation. Generally, commitment about the work is not uniform among the staffs; some are more committed and they often seem to work hard than the less committed one. Therefore for better implementation, monitoring of the jobs should be there in the system. Effective monitoring definitely brings out good result. The committee should review the work periodically for better impact of the programme. KAYAKALP brings desired outcome in all the 7 themes of the programme if above mentioned points are taken care in the programme.

1.2 Objectives:

Overall objective of the study is to assess the level of implementation and impact of KAYAKALP programme in the PHCs of the study districts and Karnataka state as a whole.

Specific Objectives are:

- To assess the level of awareness on various themes of KAYAKALP among the Medical Officer of PHCs;
- To gauge the level of implementation of KAYAKALP programme in the PHCs of the selected districts and in the state;
- To assess the impact of the KAYAKALP on service output, infectious diseases and behavioral change among the PHCs staffs etc.;
- To know the patients' level of satisfaction on implementation of KAYAKALP.

1.3 Methodology

1.3.1 Sample coverage & methodology

The Government of India has suggested to conduct the study in 5 districts which are selected for conducting Programme Implementation Plan (PIP) monitoring studies. Further, it suggested to select five facilities from each of the selected district. Following their guidelines, we have selected five districts in Karnataka state, namely, Chitradurga, Mandya, Hassana, Uttra Kannada and Dharwad. In the selected districts, five commendation PHCs were selected randomly. The list of commendation facilities sent by the MoHFW, New Delhi was used for this purpose. Altogether, 25 PHCs have been chosen for the study. In the selected facilities, personal interview was conducted with the Medical officer (MO) or administrative medical officer (AMO) to assess their knowledge on KAYAKALP programme. Knowledge questionnaire was prepared on thematic areas of the KAYAKALP and the same was administered to the PHC's head. In total, 25 interviews were conducted with MOs/AMO/Staff Nurse.

The level of the programme implementation was assessed using KAYAKALP checklist for PHC with bed. It has following thematic scoring area with maximum score of 180 per PHC - PHC Upkeep, sanitation and hygiene, waste management, infection control, support service, hygiene promotion and beyond hospital boundary. The thematic areas are further divided into different criteria. Each criterion is assessed on the basis of checkpoints. The assessment method used were direct observation, interview with concerned staff and record verification. The

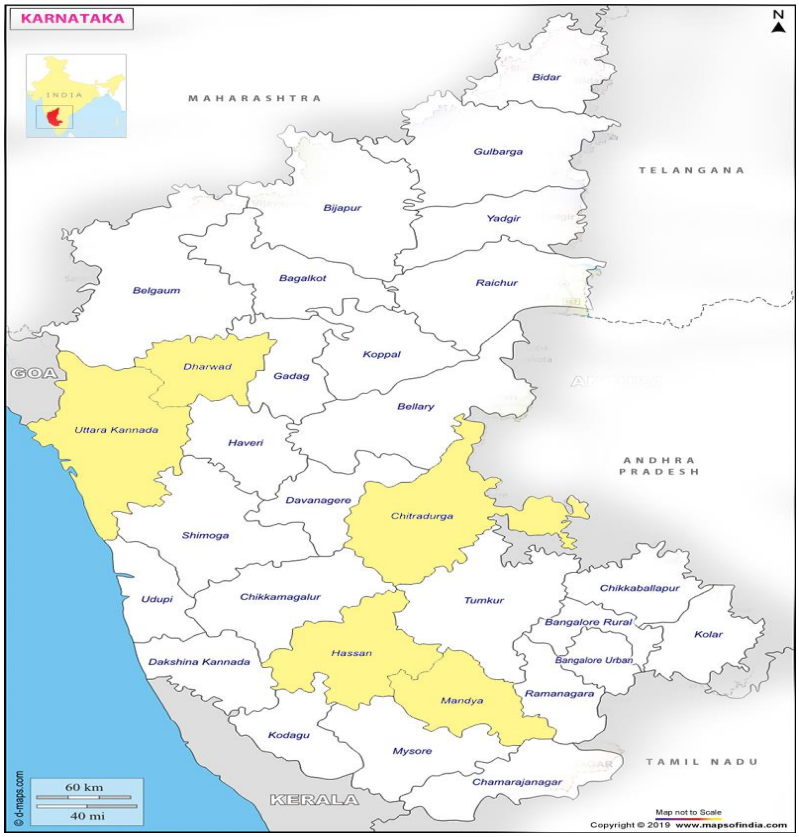
information on the level of facility cleanliness, display protocols, landscaping, signage etc. were gathered through direct observation. The information such as correct method of wearing gloves, handwashing method, cleaning method of floor etc. were collected by discussing with the staffs. Information related to housekeeping, BMW management, KAYAKALP training conducted for the staff, staff immunization status and health check-up etc. were obtained by verifying respective registers. The scores were assigned as 1 for fully compliance, if all requirements of checkpoints are found and 0 for non-compliance, i.e., if the criteria in the facility fails to fulfill at least 50 percent of its standard requirement given in the check points. Individual PHC scores is the percentage score obtained out of the maximum score. Similarly, overall score of the PHCs is the addition of individual PHC score obtained out of maximum score of all facilities (25*180=4500). Altogether, twenty-five PHC were covered.

Table 1: Sample coverage

District	Taluk	PHC	District	Taluk	PHC
1 Chitradurga	1 Chitradurga	1.Pandarahalli	**4 Uttara Kannada**	9 Karawar	16 Devalmakki
	2 Challakere	2.Sanekere		10 Honnavara	17 Manki
		3.Jajur		11 Yallapura	18 Nandilli
		4.Doddaullarthi		12 Sirsi	19 Banavasi
		5.B. R. Halli		13 Joida	20 Ramanagara
2 Mandya	3Mandya	6.Tubinkere	**5 Dharwad**	14 Dharwad	21 Garag
		7.Soonagahalli			22 Nehrubagar
		8.Basaralu		15 Hubli	23 Aralikatti
		9. Kothathi			24 Noolvi
	4 Srirangapatna	10.Krishna Raja Sagara		16 Kalaghatagi	25 Galagi Hulkoppa
3 Hassan	5 Arakalagodu	11. Ramanathapura			
		12. Doddmogge			
	6 N.R. Pura	13 Halekote			
	7Arasikere	14 Kamasamudra			
	8 Alur	15 K. Hoskote			

The impact of KAYAKALP was assessed at two point of times i. e., 2015-16 and 2018-19 and the assessment was done mainly on 5 areas namely impact on PHC service utilization by the public, impact on morbidity, staff safety measure, impact on work efficiency, community participation in PHC activities and improvement occurred before and after launching

KAYAKALP. Under service utilization, annual patient load and annual delivery load are considered. Under morbidity, number of diarrhea and pneumonia cases reported are considered; under staff safety measures, staffs of PHC who have received TT immunization and Hepatitis B injection are taken into consideration; for impact assessment of work efficiency, awards received and positive change in the behavior of staff are considered; participation of community members and member of Panchayat Raj institution in PHC activities are considered for assessing impact on community participation; besides, we have asked the PHC staffs to compare the level implementation of KAYAKALP at the beginning of the programme and the latest status of the programme on each theme and asked them to rate on each theme and sought their justification for



their assigned rate. Analysis was done on district wise and for on all area. The mean score and standard deviation (SD) were computed.

The patient's satisfaction is an important parameter for assessing the impact of KAYAKALP. To measure patient's satisfaction, the patients who came for treatment were asked to rate on the key services. Overall satisfaction level was assessed using five point Lickert's Scale

(score 1 indicates very poor service and 5 indicates excellent). The mean score and standard deviation were worked and compared among the districts and all areas. Three OPD patients were interviewed from each PHC. Altogether 75 OPD patients were contacted and interviewed (maximum score is 85).

1.3.2 Study Tools

Knowledge Questionnaire: Pre-coded structured knowledge questionnaire was designed and administered to assess the knowledge level of the medical officer. The questionnaire consists of following broad sections –PHC upkeep, sanitation and hygiene, waste management, infection control, support service and hygiene promotion.

Implementation of KAYAKALP: The checklist given in the KAYAKALP manual is used for knowing the level of implementation of the programme. It has 7 thematic areas, under each thematic areas, there are 10 criteria and under each criteria, three checkpoints are existing. The data was collected through staff interview, record verification, and observation.

Impact Assessment: The impact assessment of KAYAKALP programme was done on multiple areas such as service utilization (annual patient load and annual delivery load), morbidity (annual diarrhea and pneumonia cases reported), staffs' safety measures (tetanus toxoid and hepatitis B vaccine received by the staffs), PRI and community members' involvement in PHC activities before and after implementation of KAYAKALP and staffs' views on development of PHC before and after launching KAYAKALP. The data on service utilization, morbidity, staff safety measures were collected from the PHCs' registers. The data on community and PRI participation in PHC activities and staffs views on development of PHC before and after launching the programme were collected through staff interview using five points rating questionnaire. Following areas are covered - PHC upkeep, infection control BMW management, infrastructure maintenance etc.

Exit Interview questionnaire: Seventeen rating statements related to KAYAKALP programme were framed in five point Lickert' scale. The statements are constructed on hospital cleanliness in different areas, building appearance, signage, behavior of staff etc.

1.4 Justification of the Study:

Hygiene and cleanliness is gaining more importance nowadays not only from the point of view of disease control due to infection but also from the point of view of athletic sense. The

KAYAKALP is a hygiene promotion programme for government health institutions which is launched 4 years back. Some studies on KAYAKALP programme have been conducted but majority of such studies are done on single facility such as District hospital or SDH or CHC and very less number of studies are conducted on PHC where large chunk of rural population and urban slum people access the healthcare services. For instance, annual patient load of hospitals in Karnataka in 2018-19 is 1.67 crore, 2.43 crore, 1.19 crore and 4.14 crore for District Hospital, Sub-divisional Hospital, Community Health Centre and Primary Health Centre respectively (HMIS 2019). Further, studies on impact assessment are also limited. The present study tries to present a district level and overall scenario with respect to the implementation of KAYAKALP at PHCs, impact of the programme, knowledge of the staff and patients' satisfaction. The study helps in identifying the gaps in implementation of the programme, lacunas in knowledge level of the implementer and patients' satisfaction level. The findings of the study are also facilitate to further improve the programme.

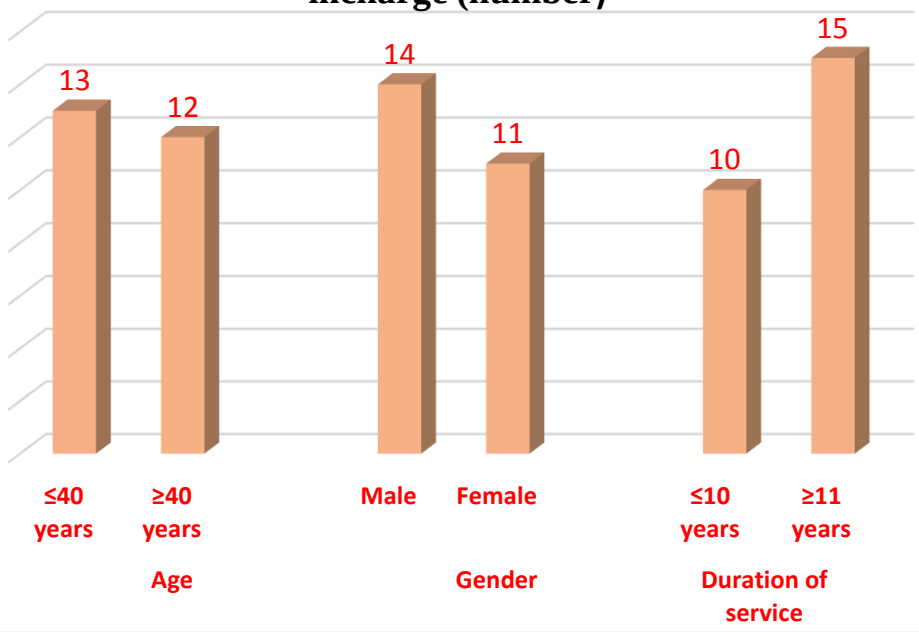
1.5 Limitation of the study: The districts and PHCs are selected randomly. Hence findings cannot be generalized.

2 Knowledge on KAYAKALP

2.1 Socio-demographic profile of the Interviewed PHC Medical Officers

Individual characteristics like age, gender, education, years of service etc. are important characteristics which influence one's knowledge acquisition and it in turn commitment in work. We have assessed the knowledge level of 25 medical officers/in-charge officer of the selected PHCs. Socio-demographic characteristics of the respondents is given in Figure 2.1. Almost equal number of MOs are distributed between two age groups, below 40 years and above 40 years.

Figure 2.1:Profile of Interviewed MO/PHC incharge (number)



n=25

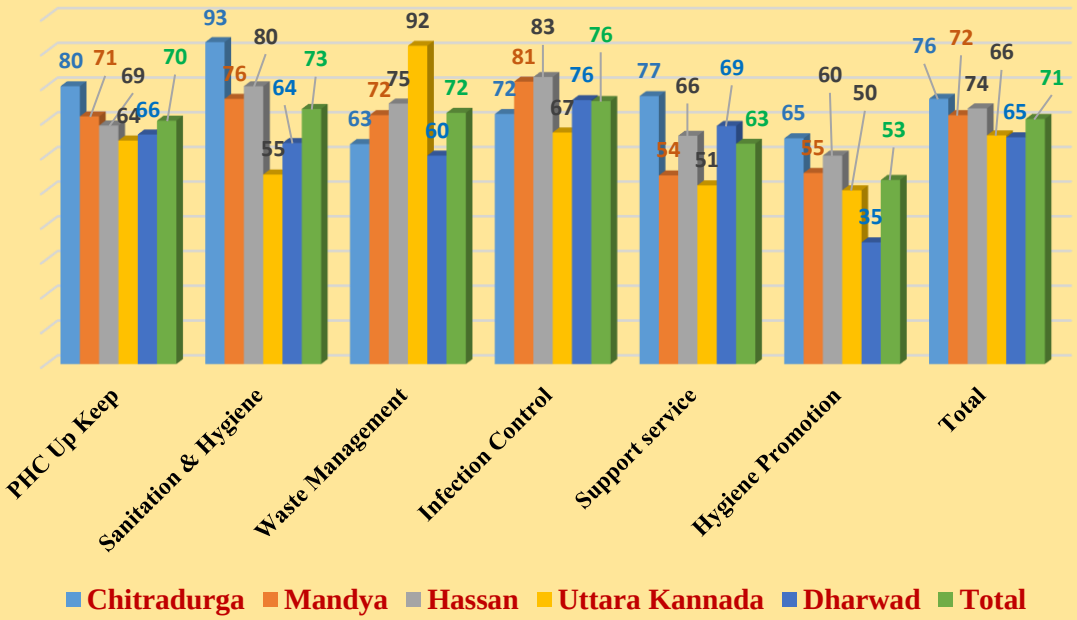
The mean age of MOs (39.4 years) indicate that respondents are belonging to middle age. With respect to gender of the respondents, males officers are more compared to the females. Majority of the informants have completed 10 or more years of in medical service.

2.2 Awareness on KAYAKALP

Complete knowledge is a prerequisite for effective implementation of any programme. Therefore, we have tried to assess the level of knowledge of medical officers of the selected PHC on different themes of the programme. There are 7 major themes in the KAYAKLP such as PHC Upkeep, sanitation and hygiene, waste management, infection control, support service, hygiene promotion, and beyond hospital boundary. Under the major themes, there are 10 sub-criteria in five major themes and 5 sub-criteria in two major themes. We have tried to assess the level of knowledge of the MOs in all the areas except beyond hospital boundary. We have asked around 60 knowledge questions related to the different themes. Information on level of knowledge is given in Figure 2.2. Overall, knowledge level is 70.5 percent. At an aggregate level, MOs have good knowledge (score more than 70 percent) on four themes namely PHC upkeep, sanitation and hygiene, waste management, infection control. With respect to the difference in scores in

knowledge among the MOs of studied districts, MOs of Chitradurga (76 %) stands first and it is followed by MOs of Hassan (74 percent) and Mandya district (72 percent). The level of knowledge of MOs of Uttar Kannada and Dharwad is low (65 percent). The reason for low level of knowledge among Uttara Kannada MOs is that not all respondents are MBBS graduate - one respondent was Block Health Educator, one was AYUSH doctor, and another was newly appointed medical officer.

Figure 2.2: Knowledge Level of MOs on KAYAKALP (in %)



n=25

Coming to theme wise difference in knowledge, no district has got more than 70 percent marks in hygiene promotion. With respect to PHC upkeep, MOs of Mandya and Chitradurga districts scored more than 70 percent. The MOs of Chitradurga, Mandya and Hassan districts are possess high knowledge in the sanitation and hygiene theme. In waste management, respondents of Dharwad and Chitradurga districts have scored less (<70%). Informants of Uttara Kannada district is the only low scoring district in infection control area, whereas MOs of Chitradurga only have good knowledge on support service sector.

It is also important to know the sub themes in which the MOs have low knowledge. The respondents have very low awareness on following areas where 50 percent of informants were not able to give correct response – Gambusia fish cultivation for mosquito free environment, display of PHC name at the entrance, preventive measures to be taken to reduce wastage and reuse of water, work place management, maintenance of window and doors, cleanliness of toilets, chemicals to be used for surface cleaning in procedure area, segregation and handling of BMW, procedure of transportation of BMW, disinfection procedure for broken /discarded glassware, maintenance of bed to bed distance in isolation ward, required quantity of water per day per bed in PHC, arrangement of medicine in pharmacy, display of posters regarding *Swachhta Abhiyaan* within the facility and display of posters regarding use of toilet within the facility etc.

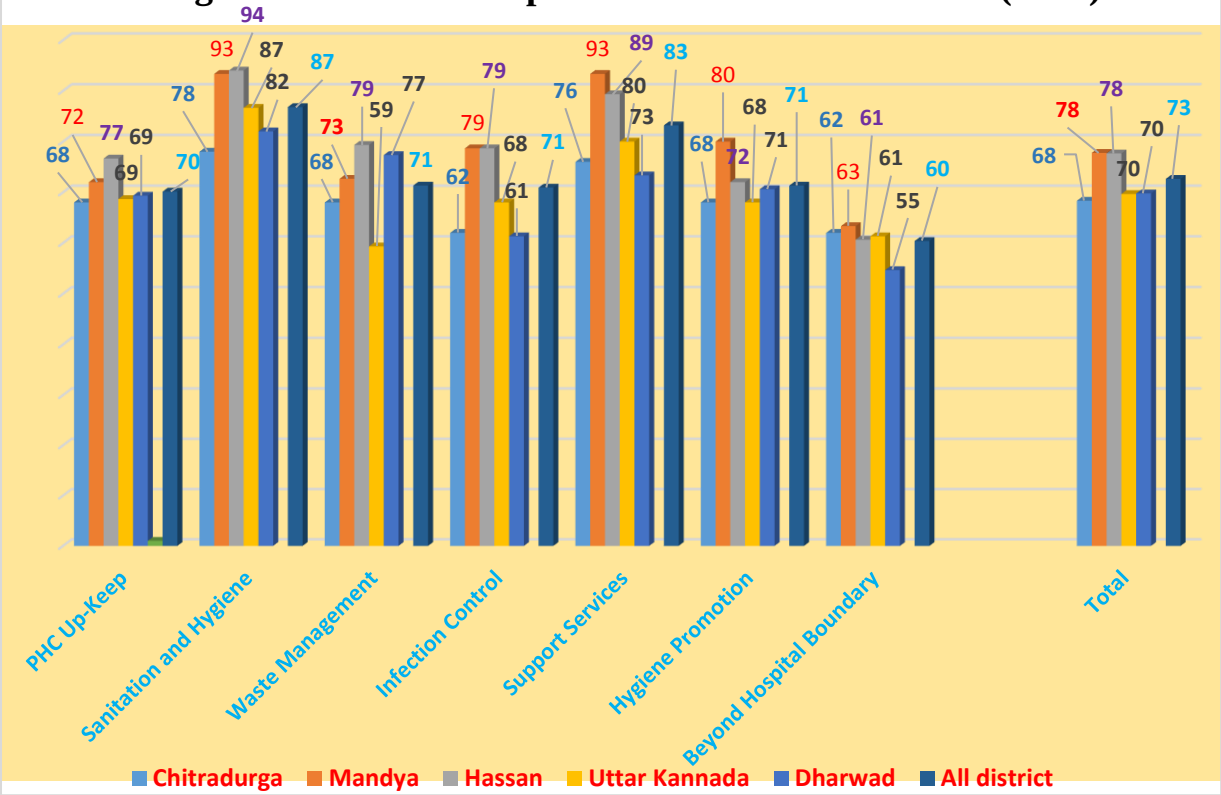
3.1 Level of Implementation of KAYAKALP

One of the objectives of the present study is to know the level of implementation of KAYAKALP programme in the selected districts. The idea to include this objective in the study is to know whether all the awarded/commendation PHCs are maintaining the same standard of implementation of the programme at the time of external assessment throughout the year or neglect the programme once they have been awarded. We have used KAYAKALP (PHC with beds) checklist and assessed the implementation level as per the guidelines. If the aggregate percentage of all the themes of a PHC is 70 or more, it mean that the PHC is maintaining the standard in implementing the programme and vice versa. District wise score and overall scores are presented in Figure 3.1. The aggregate percentage for all area is 72.64 which indicates the programme is implemented well in the study districts. Inter district variations are noticed; only Mandya (77.78%) and Hassan (77.67 %) districts have secured more than 70 percent and rest of the districts failed to attain threshold score by a narrow margin.

Theme wise analysis shows that performance of all the districts in theme ‘Beyond Hospital Boundary’ is not satisfactory as all have failed to get threshold marks (70%). The mean score in this area is only 60 percent. With respect to ‘PHC Upkeep’, all districts score is 70.13 percent. Out of 5 districts, only Mandya (72 %) and Hassan (76.66%) districts have managed to get more than 70 percent and remaining districts have got score close to 70 percent. Sanitation and Hygiene is well implemented in all the districts as each district has secured good score. The overall score of this theme is 86.80 percent. Coming to ‘waste management’, it is well implemented at the

aggregate level (71.33 percent). However, district level differences exist. The performance of Dharwad, Mandya and Hassan districts is good whereas, Uttar Kannada is doing poor. Regarding infection control in the hospitals, combined score is just 70.93 percent. Large differences among the district performance have been observed. Mandya and Hassan is doing very well whereas, remaining 3 districts are performing badly. The scores in support service is more than 70 percent in all the districts. Mandya and Hassan districts have got more than 89 percent. The aggregate score of hygiene promotion is 71.33 percent. All district have got more than 70 percent except Chitradurga (68 percent). The above discussion reveals that among the 5 districts, Chitradurga and Uttara Kannada districts' performance in implementing the KAYAKALP is poor. They failed to score more than 70 percent in 5 thematic areas out of 7 areas, while Mandya and Hassan are outstanding districts which earned more than 70 percent in all areas except 'beyond hospital boundary'.

Figure 3.1: Level of Implementation of KAYAKALP (in %)



n=25

Following are the areas where facilities' performance is very poor - maintenance of open area, documentation of condemnation policy, preventive measures taken for reducing waste and reuse of water, rain water harvesting, compost pit, innovation in managing general waste, protocol for managing discarded samples, maintenance of records as required under BMW rules 2016, procedures followed for decontamination of surface of examination table and dressing table after procedure, poor adhering of protocol for high level disinfection, recording of sterilization indicator (signal lock) in autoclave register, documentation of antibiotic policy and doctors' awareness of the same, staffs immunized against Hepatitis B, arrangement of medicines in pharmacy, assignment and communication of roles and responsibilities of different staff members in infection control committee, review of progress of the cleanliness drive on weekly basis by the leader and all the criteria which come under the theme 'beyond hospital boundary'.

3.2 Comparison between peer assessment score and PRC assessment score

The facility which scored more than 70 percent in internal assessment score are eligible for the peer group assessment (MoHFW, 2019). The district team will visit such facility to assess the level of KAYAKALP programme by assigning score to each check point at the end of the year. We have collected peer assessment score of all the surveyed PHCs from the district quality managers and compared their score with our assessment score for each PHC for the year 2018-19. The two sets of score is presented in Table 3.1.The PRC assessment score and Peer assessment score both are almost matching in 4 PHCs out of 25 PHCs. The peer team's score is higher than the PRC assessment in 15 facilities and it is lower than the PRC assessment score in 6 hospitals. We have applied 'paired t test' to the data with the following hypothesis. The null hypothesis was that no difference between the two sets of scores and alternative hypothesis was peer assessment score is more than the PRC assessment score. According to the test result the t value is 3.268 and p value is 0.003 which is significant at 0.05 level. Therefore, null hypothesis is rejected. The probable reason for higher score as per peer assessment team are the programme was well implemented at the time of peer assessment and PHCs neglected the programme once they have been awarded. The second probable reason might be the peer team might have shown some lenience in assigning the marks to the PHCs in order to encourage them.

Table 3.1: Peer assessment score and PRC assessment score, 2018-19

District	PHC	PRC Assessment score 2018-19	Peer Assessment score 2018-19	District	PHC	PRC Assessment score 2018-19	Peer Assessment score 2018-19
Chitradurga	Pandarahalli	73.9	79.1	Hassan	Ramanathpura	86.1	84.4
	Sanekere	70.6	86.1		Diddamogge	89.4	88.3
	Jajur	63.9	75.3		Halekote	80.0	80.0
	Doddaullarthi	73.9	74.7		Kamasamudra	68.9	70.4
	B. R. Halli	62.8	75.5		K. Hosakote	63.9	71.7
Mandya	Tubinkere	84.4	91.7	Uttara Kannada	Devalmakki	49.4	64.6
	Soonagahalli	70.0	79.2		Manki	73.9	80.7
	Basaralu	80.0	70.2		Nandolli	71.1	79.6
	Khothathi	73.9	70.0		Banavasi	84.4	94.2
	Krishnaraja Sagara	80.6	76.1		Ramanagara	69.4	96.7
Dharwad	Garag	64.4	71.1				
	Nehrunagara	78.9	78.8				
	Aralikatti	72.8	72.5				
	Noolvi	81.1	76.9				
	Galagihulkopps	51.7	71.7				

N=25

t= 3.268
P = 0.003

4. Impact of KAYAKALP on PHC

The aim of any health related programme is to bring positive changes in the existing condition. To assess the changes in the implemented programme, evaluator should identify some parameters. We have identified some of the measurable indicators to assess the impact of KAYAKALP programme. Such identified indicators are - change in the annual patient load, annual delivery load, annual diarrhea cases and pneumonia cases reported, improvement in the health staffs' safety measures such as staff received injection against Tetanus and hepatitis B, award bagged by the PHC. Impact assessment is done on these parameters by record verification. Necessary data has been collected for two points of time i. e., for 2015-16 and 2018-19. We have computed service utilization rate and calculated percentage change between earlier year and the recent year.

4.1 Impact on service output

Patient load and delivery load would increase if the hospital is clean, staffs are friendly and services are ensured. It is found from the Table 4.1 that there is an increase in the annual patient load of the visited facilities; overall 24 percent increase has been noticed between 2015-16 and 2018-19. The highest increase is noticed in PHCs of Dharwad district and the least is recoded in PHCs of Hassan district. Similar kind of development is not found with respect to the annual delivery load. For all area, 19 percent decrease in delivery load has been noticed between 2015-16 and 2018-19. Further, it is noticed that the performance has come down in three districts and has increased in two district namely Chitradurga and Dharwad. The reasons for low performance in delivery are the rural mothers are preferred to deliver in higher level hospitals, In Hassan district geographical distance between two PHCs are less and catchment population of some PHC is less (2000-3000). Therefore, patient load and delivery loads are distributed between nearby PHCs.

4.2 Impact on communicable illness

Communicable disease rate will be less if the sanitation and hygiene condition of facility and surrounding area is good. We have considered annual diarrhea and Pneumonia cases reported for assessing the impact. Table 4.1 shows that Pneumonia cases have decreased significantly between 2015-16 and 2018-19; whereas 13 percent increase has been noticed in diarrhea cases in all areas. Increase in number of cases of Diarrhoea is not uniform in all the studied districts. However, it has decreased from 32 to 34 percent in Hassan and Mandya where the KAYAKALP is well implemented. Household hygiene and personal hygiene practice is also matters in the incidence rate of infectious diseases.

Table 4.1: Impact of KAYAKALP on Service utilization & morbidity

	Chitradurga			Mandya			Hassan			Uttara Kannada			Dharwad			All area		
Service	2015-16	2018-19	% change	2015-16	2018-19	% change	2015-16	2018-19	% change	2015-16	2018-19	% change	2015-16	2018-19	% change	2015-16	2018-19	% change
Patient load	76811	84252	9.69	56778	75524	33.01	57051	57217	0.29	42795	50608	18.26	99484	143645	44.39	3E+05	411246	23.53
Delivery load	214	493	130.4	214	208	-2.8	257	98	-62.65	212	189	-10.85	602	728	20.93	2114	1716	18.83
Diarrhoea	432	763	76.62	707	466	-34.09	101	69	31.68	0	489	0	646	810	25.39	2297	2597	13.06
Pnuemonia	30	32	6.67	2	2	0	0	0	0	2	0	-100	372	0	-100	406	34	91.63

4.3 Impact on Staff Safety

Safety of health staff of the health facilities is important. It is mandatory of all the health facilities to administer the TT injection twice in a year and all the doses of hepatitis B vaccine to its staffs and the same should be recorded in the register. It is noticed from the Table 4.2 that there is a good improvement in staff vaccination programme in the studied districts during the reference period. In 2015-16, 10 PHC staffs had received TT injection, number of such PHC has doubled in 2018-19. Coming to the hepatitis B vaccination, only 7 PHC staff had received the vaccination in 2015-16 and the number has increased to 18 in 2018-19.

Table 4.2: Impact of KAYAKALP on staffs health safety & award received

Staff safety measures	Chitradurga		Mandya		Hassan		Uttara Kannada		Dharwad		All District	
	No. of PHC											
	2015-16	2018-19	2015-16	2018-19	2015-16	2018-19	2015-16	2018-19	2015-16	2018-19	2015-16	2018-19
TT injection given to staff	1	3	2	4	2	5	2	3	2	5	10	20
Hepatitis B vaccine given to staff	1	4	1	4	2	4	2	4	1	2	7	18
Number of PHC received award	1	3	2	5	3	4	1	3	3	5	10	20

n=25

Award is being given to the best performing facilities in order to encourage and acknowledge their effort in keeping the facility upright. Table 4.2 reveals that the number of awarded PHCs in the studied districts have increased from 10 PHC in 2015-16 to 20 in 2018-19. All the surveyed PHCs in Dharwad and Mandya have got award/commendation in 2018-19.

4.4 Impact on members of Panchayat Raj Institution (PRIs) and Community members

Participation and support of PRIs and Community members in PHC activities is crucial for achieving success in the health programmes and in hygiene promotion. We wanted to know whether the KAYAKALP has made any change in the mindset of people regarding involvement in the ongoing health programmes including hygiene promotion. In order to know the fact in this regard, we have asked the PHC staff to assign a rate within 1 to 5 to indicate the extent of civil

society members' participation in PHC activities at two points of time (2015-16 & 2018-19). Score '1' indicates very poor participation and score '5' indicates excellent participation. We have

Table 4.3: Impact of KAYAKALP on community members, PRI members and behaviour of PHC staffs

Type of person		Chitradurga		Mandya		Hassan		Uttara Kannada		Dharwad		All	
		2014-15	2018-19	2014-15	2018-19	2014-15	2018-19	2014-15	2018-19	2014-15	2018-19	2014-15	2018-19
Community members	Mean	1.60	2.40	1.00	1.80	1.00	1.80	1.50	3.25	1.50	3.25	1.29	2.04
	SD	±0.89	±1.34	0.00	±1.09	0.00	±1.09	±0.73	±0.5	±0.73	±0.5	±0.62	±0.45
PRI members	Mean	2.40	3.00	1.80	2.40	1.80	2.60	3.25	3.25	3.25	3.25	1.17	2.42
	SD	±1.34	±1.22	±1.10	±1.34	±1.10	±1.52	±0.68	±1.5	±0.68	±1.5	±1.12	0.00
Behaviour of Staff	Mean	1.60	2.40	1.00	2.80	1.00	3.80	2.00	4.25	2.00	4.25	1.55	3.33
	SD	±0.55	±1.52	0.00	±1.64	0.00	±0.45	±0.80	±0.5	±0.80	±0.5	±0.72	±0.89

calculated mean score and standard deviation on the basis of score obtained. District wise and indicator wise mean score is given in Table 4.3. The table shows that mean score has improved from the year 2015-16 to year 2018-19 in all areas. Participation of community members and member of PRIs in the PHC activities has increased but not significantly. The mean score is little more than one and SD is less than 1 in 2015-16 for all areas, but it has increased to little more than 2 (SD=1) in 2018-19. The staffs interviewed reported that community members and PRI members used to attend the PHC programme less frequently before implementing the KAYAKALP; they neglected the PHC and PHC staff used to visit their homes to get signature on the meeting register and on the cheque leaf. Their frequency of visit to PHC has increased after implementation of the programme, they are voluntarily visiting the facility and monitoring the activities particularly the cleanliness; they are extending necessary help too. The staffs opined that PRI and community members' impression about PHC has changed positively after implementation of the programme.

4.5 Impact on PHC Staffs

The health staffs have received training on various components of KAYAKALP and their knowledge and practice has improved on hygiene and BMW management. We have tried to assess the improvement in their health promotion practice. The PHC staffs were asked to rate about their quality of health practice earlier (2015-16) and in the recent past (2018-19). The mean score and standard deviation is given in Table 4.3. It is revealed from the table that the mean score has

significantly improved after implementation of the programme in all the districts and the highest increase is noticed in Dharwad and Uttara Kannada district. The staffs shared their views in this way – before launching the KAYAKALP, staffs had inadequate knowledge on hygiene and following faulty hygiene practices, nobody was monitoring the cleaning work, and also no health checkup and regular vaccinations programme for the health staff. After implementation of the programme, the staffs have got training and their knowledge has improved on hygiene and BMW etc. Regular health checkup and vaccination are being done to PHC staffs and the staffs are treating the patients with respect etc.

4.6 The staffs' views on PHC condition before and after the implementation of KAYAKALP

The staffs' opinion were captured on following areas to assess improvement before and after implementation of KAYAKALP – Pest control, infrastructure maintenance, BMW management, infection control, maintenance of open area and signage. It was done through the staff interview. Five points rating statements on the above mentioned areas of the programme were prepared and administered to the PHC staffs. The rate '1' indicates very poor and '5' indicates excellent. The district wise and indicators wise mean scores have been computed for 2015-16 and 2018-19 and the same is compared to assess the improvement in the programme over a period of time. Further, we asked the staffs to substantiate the rate which they have given to each theme.

Pest Control: Overall mean score on pest control is 2.54 in 2015-16 and it has increased to 4.54 in 2018-19. Looking at the district wise mean score, all districts have secured scores less than 2.8 at the initial year and it has crossed 4.4 mark in the year 2018-19. The SD is less than 0.60 for all the districts at both point of times except Chitradurga. The respondents' justification for the given rate goes like this – Before implementing the programme there was no pest control mechanism - no mosquito net, no pesticides, no rat traps, no messed window, stray animals were grazing around the PHC etc. Pests are under control now as rat traps, and pesticides, messed window and mosquito net are available in the PHC.

Infrastructure Maintenance: Regarding infrastructure maintenance, the average score of all area is 2.54 in 2015-16 and the latest year score stands at 4.67. Almost similar kind of improvement has been observed as far as the studied districts are concerned. The PHC staffs are

of the opinion that infrastructure maintenance was very poor before implementation of KAYAKALP – chipped and blemished walls, damping roof, no decent sitting arrangement to the patients as well as to the staff, no immediate repair of broken or out of ordered fixtures like table, chair, selves and instruments, no drainage facility etc. was the state of affair of the PHC. The condition is entirely different now. Well plastered and painted wall, modern furniture & fixtures, immediate repairing facility, electricity backup facility, proper drainage etc. are available now.

o-medical Management: Coming to bio-medical waste management, average marks of all districts is 2.58 with 1.06 standard deviation in 2015-16 and corresponding score and SD in 2018-19 is 4.42 and 0.58 respectively. Inter district variation is noticed in the mean scores. The range of mean score of the districts in 2015-16 is 1.75 to 3.0, whereas in 2018-19 the range of average score of districts is 4.40 to 4.75. The staffs of PHCs described the earlier condition and the latest development on waste management like this – Earlier, regular disposal of bio-medical waste and treatment of the same before disposal was not in practice, no segregation of waste, all wastes were used to put in one bin, no color coded bins and liners were available, no use of personal protective equipments (PPE), used needles were stored in one bin and they used to sell it to private parties. The staffs had low knowledge on BMW management. Now, waste management practice has improved a lot. Regular disposal of BMW is available. The PHCs have tie up with private agencies for waste disposal at common treatment facility (CTF). Segregation of BMW is being done at waste generation points. Color coded bins, liners, PPE are available now. The staffs have been trained in BMW management and infection control. They are adhering to BMW protocol.

Infection control: Like other indicators, infection control score is less (2.71, SD 0.91) in 2015-16 and it has improved well (4.42, SD-0.65) in 2018-19 for all area. Similar picture is emerging with respect to different districts. The mean score of the districts is more than 4.20 and SD is less than 1 in 2018-19. The respondents' logic beyond the assigned score at both the times is as follow - in 2015-16, no unidirectional mopping system was in practice, three bucket system didn't exist, only one mop was being used to clean the entire hospital area, preparation of disinfectant solution was not scientific, only one time mopping took place, nobody was monitoring the cleaning work, cleaning work was not being documented, there was no spill management kit, low knowledge on spill management and infection control among the staffs, use of gloves was less frequent and single glove was being used to conduct procedure for multiple patients. At present,

cleaning staffs are practicing unidirectional wet mopping, using 3 bucket system for mopping, using different mops for high risk area and low risk area, disinfection solution are being prepared as per the protocol, adequate cleaning materials and disinfectants are ensured, standard quality disinfectants are available, mopping the floors is being done two-three times in a day, spill management kit is available, medical staffs are using disposable gloves for conducting procedures.

Table 4.4: The staffs' views on PHC condition before and after the implementation of KAYAKALP

Themes		Chitradurga		Mandya		Hassan		Uttara Kannada		Dharwad		All	
		2014-15	2018-19	2014-15	2018-19	2014-15	2018-19	2014-15	2018-19	2014-15	2018-19	2014-15	2018-19
Pest control	Mean	2.80	4.60	2.60	4.40	2.60	4.60	2.50	4.50	2.50	4.50	2.54	4.54
	SD	±1.10	±0.55	±0.55	±0.55	±0.55	±0.55	±0.54	±0.55	±0.54	±0.58	±0.83	±0.55
Infrastructure maintenance	Mean	2.40	4.40	2.80	4.80	2.80	4.80	1.75	4.50	1.75	4.50	2.54	4.67
	SD	±1.14	±0.55	±0.84	±0.45	±0.84	±0.45	±0.50	±0.58	±0.50	±0.58	±1.10	±0.45
Bio-medical waste management	Mean	2.40	4.40	3.00	4.60	3.00	4.40	1.75	4.75	1.75	4.75	2.58	4.42
	SD	±1.14	±0.55	±0.71	±0.55	±0.71	±0.55	±0.51	±0.5	±0.51	±0.5	±1.06	±0.71
Infection control	Mean	2.80	4.20	3.20	4.40	3.20	4.60	2.00	4.75	2.00	4.75	2.71	4.42
	SD	±1.30	±0.45	±0.84	±0.89	±0.84	±0.55	±0.52	±0.5	±0.52	±0.5	±0.91	±0.84
Maintenance of open area	Mean	2.80	4.40	3.20	4.40	3.20	4.20	2.00	4.25	2.00	4.25	2.58	4.25
	SD	±0.84	±0.55	±0.45	±0.55	±0.45	±1.09	±0.60	±0.5	±0.60	±0.5	±0.88	±0.71
Uniform signage	Mean	2.60	4.20	3.40	4.80	3.40	4.40	2.00	4.25	2.00	4.25	2.58	4.25
	SD	2.60	4.20	3.40	4.80	3.40	4.40	2.00	4.25	2.00	4.25	2.63	4.60
All indicators	Mean	2.60	4.40	3.02	4.43	2.74	4.54	2.00	4.39	2.49	4.37	2.60	4.43
	SD	±1.05	±1.16	±1.07	±1.36	±1.07	±1.23	±0.80	±0.89	±0.80	±1.44	±1.05	±1.44

n=25

Maintenance of open area: Overall mean score indicates that the maintenance of open area in the surveyed PHCs is well maintained in 2018-19 compared to the year 2015-16 (mean score 4.25 against 2.58). The standard deviation is less than '1' at the both point of time. There is not much variation in the mean scores among the districts. The staffs have reported that there were lot of weeds and untrimmed trees and plants in the PHC area earlier. The families which were staying near to the PHC used to dump the household waste in open area and also used it for defecation as compound wall didn't exist. At present, regular weeding and trimming of branches of trees and plants are being done. Utilization of hospital area for private use has been stopped as

compound wall has been built. Front area is looking good as garden has been developed. The parking palace is made available now.

Uniform signage system: Earlier, only few boards were present, and it was not systematically done. Now uniform signage is available in the facilities. The aggregate mean score for signage in 2018-19 is 4.25 with 0.90 SD, and the corresponding scores in 2015-16 is 2.58 and 1.02 respectively. All the surveyed districts have secured 4.20 or more mean scores in 2018-19. It indicates that systematic signage is existing at all most all surveyed facilities.

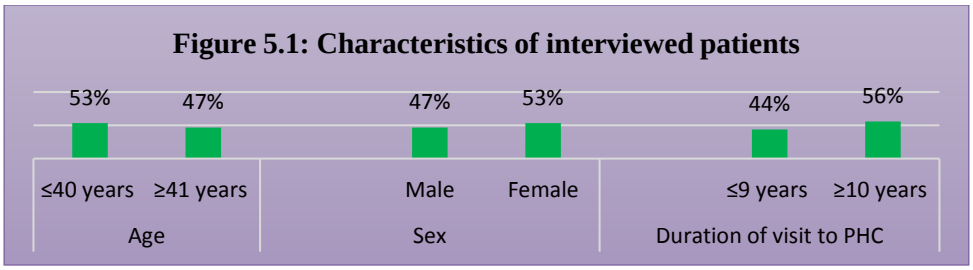
Coming to the overall mean score (all indicators), it is 4.46 in 2018-19. It means the level of improvement in the programme is more than good and less than excellent. In other terms, the programme is implemented well in the studied district.

5 Patients' Satisfaction

We have tried to get the feedback from the beneficiaries of the visited PHC through exit interviews on different themes of KAYAKALP. We have interviewed 3 patients from each visited PHC after taking their consent. Altogether, we have contacted and collected information from 75 patients who have received treatment from the hospital. The patients are randomly selected. Simple and easily understandable 17 rating statements in 5 point scale have been framed to assess the patients' satisfaction level on PHC after the implementation of KAYAKALP. We have solicited their opinion on cleanliness inside and outside the facility, signage, pest control, parking facility, illumination, staff behavior and behavior of co-patients in maintaining the hospital cleanliness. The rate '1' indicates very poor and rate 5 indicates excellent.

5.1 Profile of respondents

Figure 5.1provides patients' demographic information such as current age, gender and duration of visit to the facility. Little more than half of the informants are below 40 years. The mean age of respondents is 43 years. Fifty-three percent of respondents are females. Simple majority of study participants have been visiting the PHC for treatment for more than 10 years. Mean duration of visit is 13.85 years.



n=75

5.2 Patients' satisfaction on implementation of KAYAKALP

Table 5.2 shows that majority of respondents are having excellent and good opinion on implementation of KAYAKALP programme. Seventy-seven to 87 percentage of respondents have excellent opinion on behavior of hospital staffs particularly the Medical Officer, staff nurse and other staffs. Similarly, 51 to 61 percent of the clients opined that condition of PHC building, cleanliness in patient waiting area, control of stray animals inside the hospital boundary, general waste management and lighting arrangement in PHC area are maintained very well. Overall, majority of interviewed patients expressed either good or excellent opinion on almost all services and arrangements made in the PHCs. They did not express their opinion on the services which they never utilized it, for example toilets, beds etc.

Table 5.2 Patients' satisfaction rate on selected check-points of KAYAKALP

	Rate (%) n=75					
Patients' rate on	Excellent	Good	Fair	Bad	Very bad	Can't say
Cleanliness around PHC	40.00	45.33	6.67	4.00	4.00	0.00
Signage in PHC	48.00	24.00	9.33	0.00	1.33	17.33
Condition of building	61.33	25.33	10.67	2.67	0.00	0.00
Painting	48.00	26.67	13.33	9.33	0.00	2.67
Parking facility	29.33	21.33	5.33	12.00	22.67	9.33
Cleanliness in waiting area	60.00	32.00	5.33	1.33	1.33	0.00
Presence of stray animals in PHC area	56.00	18.67	5.33	4.00	13.33	2.67
Pest control	41.33	26.67	13.33	12.00	5.33	1.33
Elimination in PHC	54.67	24.00	12.00	2.67	0.00	6.67
Clean beddings	42.67	21.33	12.00	1.33	0.00	22.67
Cleanliness in toilets	26.67	22.67	16.00	2.67	0.00	32.00
Availability of waste bins at waiting area	50.67	20.00	10.67	2.67	13.33	2.67
Cleanliness maintained by fellow patients	46.67	36.00	10.67	2.67	4.00	0.00
Behaviour of doctor	86.67	10.67	2.67	0.00	0.00	0.00
Behaviour of SN	81.33	17.33	1.33	0.00	0.00	0.00
Behaviour of other staff	77.33	20.00	1.33	1.33	0.00	0.00

5.3 Mean satisfaction score of patients Interviewed

Overall mean score of patient is 3.94 and average score is more than 4 for 9 items such as, cleanliness in front and surrounding areas of PHC, physical infrastructure, painting of building, cleanliness inside PHC, illumination, maintenance of cleanliness by the patients, behavior of medical officer, behavior of staff nurse and other staff. District wise analysis also reveals almost similar findings. In Hassan district, mean satisfaction score of 12 indicators is more than 4. In Chitradurga, Uttara Kannada and Dharwad districts, 9 indicators mean score is more than 4. The indicators belonged to the staff behavior of PHC (MO/SN/Other staff) and cleanliness inside the PHC are secured score more than 4 in all the districts.

Table 5.3: District wise and overall patients' mean satisfaction score

	District											
	Chitradurga		Mandya		Hassan		UK		Dharwad		All area	
Rate	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
PHC front area/open spaces	4.27	±1.03	3.63	±0.90	4.53	±1.03	4.20	±1.08	4.00	±1.13	4.13	±0.99
Uniform signage system	2.87	±2.17	3.22	±1.92	3.80	±2.17	4.33	±1.11	3.73	±1.71	3.65	±1.84
Physical infrastructure	4.40	±0.63	4.22	±0.74	4.80	±0.63	3.93	±1.16	4.73	±0.46	4.45	±0.79
Building painting	4.07	±1.44	3.42	±1.25	4.87	±1.44	3.73	±1.28	4.07	±1.03	4.05	±1.20
Space for parking vehicle	3.07	±1.58	2.54	±1.80	2.73	±1.58	3.47	±1.41	2.87	±1.81	2.95	±1.82
Garden/herbal garden	3.33	±1.34	1.98	±1.37	3.27	±1.34	2.73	±1.49	2.87	±1.73	2.80	±1.66
Cleanliness in PHC	4.33	±0.62	4.33	±0.49	4.80	±0.62	4.40	±0.91	4.20	±1.15	4.48	±0.78
Pest & Animal control	4.20	±1.26	3.58	±1.96	4.13	±1.26	3.73	±1.44	3.93	±1.58	3.92	±1.56
Pest control	3.93	±0.96	3.22	±1.37	4.20	±0.96	4.00	±1.41	3.80	±1.32	3.83	±1.31
Illumination inside & outside the facility	3.40	±1.68	3.67	±1.71	4.47	±1.68	4.53	±0.64	4.40	±0.83	4.11	±1.36
Cleanliness of bed-sheets, pillow cover and linen	3.53	±1.92	2.58	±2.35	3.33	±1.92	3.87	±1.36	3.73	±1.44	3.37	±1.97
Cleanliness in toilet & bath room	2.27	±2.09	2.35	±2.27	2.87	±2.09	3.47	±1.60	3.07	±1.71	2.77	±2.05
General waste management	2.87	±1.85	4.32	±0.63	4.67	±1.85	3.60	±1.55	3.47	±1.41	3.84	±1.53
Maintenance of cleanliness of facility bt patients/ visitors	4.00	±1.13	4.01	±0.86	4.67	±1.13	4.07	±1.39	4.00	±0.85	4.19	±1.01

Behaviour of medical officer	4.93	±0.26	4.68	±0.26	4.87	±0.26	4.87	±0.35	4.60	±0.74	4.84	±0.44
Behaviour of staff nurse	4.73	±0.46	4.51	±0.41	4.87	±0.46	4.80	±0.56	4.80	±0.41	4.80	±0.43
Behaviour of other staff	4.67	±0.49	4.56	±0.35	4.80	±0.47	4.60	±0.91	4.73	±0.46	4.73	±0.55
Mean/SD	**3.82**	**±1.51**	**3.69**	**±1.65**	**4.22**	**±1.58**	**4.02**	**±1.29**	**3.94**	**±1.35**	**3.94**	**±1.49**

Low scoring (mean score <3) indicators in all areas are - space for parking vehicle, maintenance of garden and cleanliness in toilet and bath rooms. At district level, low scoring indicators are - cleanliness in toilet, space for vehicle parking, maintenance of PHC garden, signage, clean bedsheets and pillow cover, and general waste management. In Mandya district, 4 items had a score less than 2 marks, such items are 3 in Chitradurga and 2 in rest of the districts. The highest average score for all items is earned by Hassan district with 4.22 and followed by Uttara Kannada district with 4.02. The average score of all indicators in rest of the district varies from 3.69 to 3.94. Overall, patients have very good opinion on implementation of KAYAKALP programme (Table 5.3).

6. Action points

- PHCs are not maintaining registers on patients who suffered from injection abscess, postpartum sepsis, infection and suturing sites, hospital acquired infection (HAI) etc.
- Majority of PHCs are formed the infection control committee and maintained the register. The meeting resolution shows that meetings are held only for name sake. Fruitful discussions, review of work and relevant resolutions are not being passed in the meetings.
- The roles and responsibilities of each committee member are not being told and delegated.
- Majority of PHCs have not given due importance to the theme 'beyond hospital boundary'.
- Hygiene promotion work is not being done to the excepted level.
- Posters are not displayed in a rationalized way. It is either pasted at the top of the wall or sometimes enough space is not kept between two posters or the posters are duplicated etc.
- The procedure of taking patient's feedback is missing in many visited hospitals.
- Sensitization of patient's responsibility is not being done.
- PPE use by the cleaning staff is poor.

- It is found that housekeeping checklist are checked before completing the work, in some facilities it is done before one week itself.
- Some MOs are not aware of statuary compliances of sending annual report to pollution control board.
- The BMW generated in the facility is not being handed over to CTF because the agencies are not visiting regularly to collect the waste (visits only once in 3 days).
- Majority are not following the proper dress code.

7. Summary and conclusion

In a nutshell, the study has been conducted in 25 PHCs of 5 districts. Knowledge of medical officers, implementation level of KAYAKALP Programme in PHCs, impact of the programme and patients' satisfaction level are assessed. Overall, MOs have good knowledge on KAYAKALP and implemented the programme well with minor gaps. Impact of the programme is also well established according to the survey findings and PHC data. Besides, patients as well as PHC staffs have expressed good opinion with regard to the programme performance.

Coming to the detailed findings of the study, at aggregate level, awareness level among the interviewed staff is high. Out of 7 broad themes of KAYAKALP, MOs possess good awareness on 4 themes namely PHC upkeep, sanitation and hygiene, waste management and infection control. Respondents of Chitrdurga have good knowledge and it is followed by MOs of Hassan and Mandya districts.

With respect to implementation of the programme, overall, it is implemented well. The level of implementation is found to be good in Mandya and Hassan districts and it is moderate in rest of the surveyed districts. Theme wise score for all areas indicates that the performance of all themes are good except 'beyond hospital boundary'. Variations in themes' score in different districts have been noticed. However, themes such as 'sanitation and hygiene' and 'support services' are found to be good in all the district. Performance of Dharwad district is poor in implementing 'PHC Upkeep' and 'Infection Control'. Similarly, Chitradurga and Uttara Kannada districts' performance is not satisfactory in implementing 4 KAYAKALP themes namely, PHC Upkeep, Waste Management, Infection Control and Hygiene Promotion.

Regarding the impact of KAYAKALP programme on various health areas between 2015-16 and 2018-19, patient load of PHCs has increased after implementation of the programme. Number of individuals infected with pneumonia has decreased whereas, diarrhea cases has increased between 2015-16 and 2018-19. Number of PHCs providing Tetanus Toxoid injection and hepatitis B vaccine to its staff has raised after launching the programme. Number of PHCs awarded for good performance has increased from 10 in 2015-16 to 20 in 2018-19. Participation of PRIs and community members in PHC activities has also improved between 2015 and 2018. The professional skills of staffs are enhanced through training, their behavior with patients has changed positively, and working style has improved. The PHC upkeep, infection control, BMW management, support service, hygiene promotion etc. are improved a lot after implementation of KAYAKALP Programme.

KAYAKALP is a very good programme to improve infection and hygiene condition of health facilities. It is proved from the survey that the programme has succeeded in bringing out many positive changes in health institutions. It is being noticed that several health institutions are not showing interest to compete for commendation/award. It may be because of manpower problem, shortage of fund and lethargic attitude of medical officers etc. It will be good if all health institutions would come forward to participate and show interest in developing their hospitals on the line of KAYAKALP.

Recommendation

- Registers to be made available on HAI
- Responsibilities of infection committee members should be communicated to each member.
- Posters should be displayed rationally.
- Sensitize patients about their responsibility through print or electronic media or interpersonal communication.

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