# A study of the status of provision of sterilisation services in India

# Surya Bali<sup>1</sup>, Kriti Yadav<sup>1</sup>, Yash Alok<sup>1</sup>

<sup>1</sup>Department of Community and Family Medicine, All India Institute of Medical Sciences, Bhopal, Madhya Pradesh, India

#### **ABSTRACT**

Context: India has the second-largest population in the world with a significant growth rate that adversely affects the quality of life (QoL). Sterilisation is one of the main methods of female contraception in the country. Meeting the sterilisation services' numerical demand and quality requirements have remained a challenge. Aims: This study was done to assess the infrastructural component of the sterilisation services provided by the static centres. Settings and Design: This was a descriptive cross-sectional facility-based study conducted from September to December 2017. It involved 30 facilities (10 district hospitals and 20 community health centres [CHCs]) from 10 divisions of the state of Madhya Pradesh. Methods and Materials: The data were collected using a pre-tested and pre-structured questionnaire, which was uploaded on the Ona platform. Statistical Analysis Used: Data analysis was performed using SPSS version 21. Results: Only 11 of the 30 facilities had proper waiting areas for the patients. Approximately, only 63% of the facilities had proper toilets, 50% had display of the contraceptives, and 43% had a complaint/suggestion box. In terms of the availability of equipment, only 43% of the facilities had a table with the Trendelenburg facility. Conclusions: The main limitations in the infrastructure of the facilities were general cleanliness; availability of proper waiting and post-operative areas; and the lack of equipment, record keeping, and supervision. To accomplish the provision of quality sterilisation services, policy-makers and programme managers need to pay attention to and address these limitations.

**Keywords:** Fixed day static, India, infrastructure, sterilisation services

#### Introduction

India is the second-most populous country in the world, only behind China, with a whopping population of 1,324,171,000,<sup>[1]</sup> which means that almost every one out of six individuals in the world lives in the country. Additionally, it has a 1.1% growth rate,<sup>[2]</sup> which is also a major contributor to the high number of births in the country. This rapid increase in population contributes to the low quality of life (QoL) among the people, puts a stress on the country's financial resources, and hampers the overall development of the country.<sup>[3,4]</sup>

Address for correspondence: Dr. Yash Alok,
Department of Community and Family Medicine, Medical
College Building, All India Institute of Medical Sciences, Bhopal,
Madhya Pradesh, India.
E-mail: yashalokv@gmail.com

**Received:** 06-08-2019 **Revised:** 21-08-2019 **Accepted:** 26-08-2019

Access this article online

Quick Response Code:

Website:
www.jfmpc.com

DOI:
10.4103/jfmpc.jfmpc\_627\_19

To control the rising population and its effects on the country, India launched a National Family Planning Programme in 1952<sup>[5]</sup> which was emphasised upon and modified in the later five year plans. [6] The programme had some success in the form of decreasing growth rates after 1971.[4] However, long after the implementation and modifications in the programme, there was a rise in the overall population. The unmet needs in terms of the health infrastructure; labour force; management; and other problems, including lack of proper planning and attitude of the staff, as well as cultural and political constraints were titanic hurdles in the programme's goals.<sup>[4]</sup> Even after incorporation of family planning into other programmes, such as the Reproductive and Child Health Programme and the National Rural Health Mission, which aimed to focus on the unmet needs of family planning and reducing the total fertility rate to the replacement level, [7] the level of the total unmet needs for family planning has decreased by a mere single percentage point from 2005-06 to 2015-16.[8]

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

**How to cite this article:** Bali S, Yadav K, Alok Y. A study of the status of provision of sterilisation services in India. J Family Med Prim Care 2019;8:3297-302.

When it comes to the provision of the family planning services, one of the methods is surgical sterilisation, which is also the primary method of contraception in low- and middle-income countries especially among women in India. [9] The provision of sterilisation services in India is in the form of two approaches, namely, the camp approach and the fixed day static approach. The former was devised as an approach to cater to the huge numerical demand of sterilisation versus a low service availability. [10] However, it was found that the achievement of the replacement-level fertility had taken place in places where fixed day static services were provided. [11] Also, the meeting of the recommended standards for the delivery of quality sterilisation services remained questionable. [12] Due to the above reasons, efforts are being made to shift the approach of sterilisation from the camp one to a fixed day static one.

As of 2017, the number of female sterilisations has increased since the past years, with Bihar showing maximum increase. [13] There was also an increase in the facilities that provided male sterilisation and the number of male sterilisations.<sup>[13]</sup> However, in some places the unavailability of assured and regular sterilisation services because of poor execution of the fixed day approach, lack of service providers and poor preparedness of the facilities has been found. [9,14] Hence, this study, which is a part of a report on the sterilisation services in selected health facilities of the state of Madhya Pradesh, will be focusing on the infrastructure in the selected health facilities. As already discussed, the health infrastructure is essential for provision of sterilisation services. According to Bruce-Jain framework for assessment of quality of services being offered, "the state of preparedness, in terms of supplies and logistics" is one of the six pillars for the assessment. [15] As only few studies have been done delineating the quality of sterilisation services being offered at these static centres, there is a dire need for exploring the issues in providing sterilisation services to the beneficiaries. This study will help identify the gaps in the provision of infrastructural services at the primary level, as well as help the policy-makers and health administrators to make decisions regarding the rectification of the problems at the same level and beyond. Also, sterilisation services are considered as an integral part of primary healthcare, and they are to be provided at primary health centres, which have the facility and community health centres as per the Indian public health standards.

#### Aim

The present study was conducted with the aim of assessing the infrastructure available at these static centres in Madhya Pradesh for providing sterilisation services.

# **Objectives**

- 1. To study the general characteristics of the healthcare facilities
- 2. To assess the quality of the infrastructure present in the operating theatres of the health facilities
- 3. To assess the pre- and post-operative standards of sterilisation provided at the health facilities.

# **Subjects and Methods**

Study design: Cross-sectional facility-based survey.

**Study Type:** Descriptive observational study. The facilities were visited by a team of observers who studied the complete process of sterilisation from pre- to post-operative phase (till the time of discharge).

**Study Period**: Four months (September 2017–December 2017).

Sampling Units: Healthcare facilities providing sterilisation services.

**Study setting:** This study was carried out in Madhya Pradesh. One district from each of the 10 divisions was selected randomly. In each district, the district hospital (DH) and two community health centres (CHCs) where sterilisation services were being provided on a fixed day basis (static centres) were selected randomly.

**Sample size:** A total of 30 facilities (10 DHs and 20 randomly selected CHCs) were included in the study for assessing the quality of sterilisation services being provided there.

Research Team: The research team comprised of one principal investigator (PI), one public health expert (MPH) and two field investigators (MSW) for data recording. The team visited the selected facilities and collected data pertaining to sterilisation services being provided at these facilities.

Data Collection Tool: A pre-structured and pre-tested tool was used for the collection of the required information after taking consent from each beneficiary. The tool was digitalised and uploaded on Ona platform from where the team members downloaded it and filled the data from each facility and sent it to the record base. One data entry operator was assigned to check and compile all the information from the field on a daily basis. The privacy and confidentiality of the data and patient information were strictly maintained.

**Data analysis:** The data were compiled and analysed using SPSS v21. The result was expressed in term of percentage, proportion and graphs. The association between different independent variables was determined using Pearson's Chi-square test.

Ethical Clearance: Ethical permission was obtained from the Institutional Human Ethics Committee (IHEC) AIIMS Bhopal (LOP/2017/EF0069 dated 14<sup>th</sup> October, 2017). Permissions from Chief Medical and Health Officers (CMHOs) of each district were also obtained before visiting the selected healthcare facilities.

#### Results

Within the 10 selected study districts (Chhatarpur, Datia, Dewas, Guna, Harda, Jhabua, Mandla, Raisen, Satna, and Umaria), a total

Table 1: Distribution of various general characteristics of the healthcare facilities (*n*=30)

Conditions/Facilities (n=30)	Yes	CHC	DH	P
	n(%)	n (%)	n (%)	
Cleanliness of the facility	22 (73)	16 (80)	6 (60)	0.243
Availability of running water	27 (90)	17 (85)	10 (100)	0.197
Availability of functional toilet	19 (63)	12 (60)	7 (70)	0.592
Availability of electricity	30 (100)	20 (100)	10 (100)	1.000
Alternate arrangement of water	27 (90)	18 (90)	9 (90)	1.000
Availability of generator	28 (93)	18 (90)	10 (100)	0.301
Availability of proper space for	23 (77)	15 (75)	8 (80)	0.760
examination and counselling				
Availability of appropriate waiting area	11 (37)	6 (30)	5 (50)	0.284
Display of contraceptives	15 (50)	10 (50)	5 (50)	1.000
Availability of IEC materials	19 (63)	13 (65)	6 (60)	0.789
Availability of complaints and	13 (43)	7 (35)	6 (60)	0.193
suggestion box				
Display of patients/clients charter	14 (47)	9 (45)	5 (50)	0.796

CHC=Community health centres, DH=District hospitals, IEC=Information, education and communication

Table 2: Distribution of various tools and equipment in the OT of selected facilities (*n*=30)

Conditions/Facilities (n=30)	Yes	CHC	DH	P
	n (%)	n (%)	n (%)	
Functional OT	30 (100)	20 (100)	10 (100)	1.000
Running water in OT	28 (93)	18 (90)	10 (100)	0.301
OT Table with Trendelenberg facility	13 (43)	8 (40)	5 (50)	0.602
Shadow-less lamp in OT	21 (70)	13 (65)	8 (80)	0.398
Suction apparatus in OT	26 (87)	16 (80)	10 (100)	0.129
Emergency light in OT	27 (90)	17 (85)	10 (100)	0.197
Oxygen cylinder in OT	30 (100)	20 (100)	10 (100)	
Minilap instrument in OT	4 (13)	0(0.0)	4 (40)	0.002*
Laparoscopic equipment in OT	9 (30)	0(0.0)	9 (90)	0.000*
NSV set in OT	14 (47)	6 (30)	8 (80)	0.010*
Resuscitation equipment set in OT	28 (93)	18 (90)	10 (100)	0.301
Autoclave in OT	30 (100)	20 (100)	10 (100)	1.000
Emergency medicine tray in OT	28 (93)	18 (90)	10 (100)	0.301
Dressing drum with linen in OT	29 (96)	19 (95)	10 (100)	0.472
Apron, cap, mask and gloves in OT	28 (93)	18 (90)	10 (100)	0.301

<sup>7</sup>P value of <0.05 was considered to be significant. OT=Operation theatre, CHC=Community health centres, DH=District hospitals, NSV=No-scalpel vasectomy

of 30 facilities (10 DHs and 20 CHCs) in Madhya Pradesh were visited to ascertain the available infrastructure meant to deliver the female sterilisation services.

About three-fourths (73%) of the facilities were found to be clean with more of the CHCs being cleaner than the DHs. However, this finding was found to be insignificant. Majority of the facilities had running water (90%) and all of the facilities had an electric supply (100%). About 93% facilities had generator facility. Only about two-thirds (63%) of the facilities had clean and functional toilets. Proper space for examination and counselling was available in about three-fourths (77%) of the facilities. However, no significant difference was observed between the two facilities. Only 37% facilities had a proper waiting area for the clients and their attendants. More of the DHs had appropriate waiting area; however, no significant difference was observed. In only

about half of the facilities, the display of contraceptives was available in the counselling room. The information, education and communication (IEC) materials were found to be in less than two-thirds (63%) of the facilities. Only 43% facilities had suggestions and complaint box for patients, which was more in DHs as compared to CHCs [Table 1].

The majority (93%) of the facilities had running water facility. Less than half (43%) of the operation theatres had operations table with Trendelenburg facility. However, the difference between the two facilities was found to be insignificant. Out of the 30 operation theatres (OTs) observed, 70% had a shadow-less OT lamp, about 87% facilities had functional suction apparatus and 90% had an emergency light in the OT. All the facilities had facility of oxygen cylinder in the OT [Table 2].

Only 13% of the facilities had a minilap instrument in OT of which all were present in the DH. Also, the laparoscopic instrument was present in less than one-third (30%) of the facilities. The no-scalpel vasectomy (NSV) set was present in less than half of the facilities (47%), of which more were present in the DHs, and this difference was found to be significant [Table 2].

The majority (93%) of the facilities had resuscitation equipment set; emergency medicine tray and apron, cap, mask and gloves in the OT, and no difference was observed in the availability of these items in both the facilities [Table 2].

About two-thirds of the facilities (66.7%) provided weekly sterilisation services followed by 16.7%, which provided daily services. Seventy per cent of the DHs and only 10% of the CHCs had in-house surgeons, and this difference was found to be statistically significant ( $X^2 = 11.43$ , df 1, P value = 0.001).

Nine centres (30%) did not have any waiting patient. At five health facilities (16.6%), the clients were made to wait in pre-operative area; at nine (30%), they had to wait outside the OT; at three (10%), they had to wait in the hospital corridor and at four (13.3%), the clients and the accompanying persons had to wait in the OPD area.

Table 3 shows that most facilities had a post-operation waiting area, but some of the facilities used the corridor as a post-operation area, which reflected that patient care was grossly neglected. Also, in most numbers of facilities, patients had to lie down on a carpet or floor, which violates patient care to a high degree.

### Discussion

The government of India's guidelines on sterilisation<sup>[11]</sup> were used to assess the preparedness of the DHs and CHCs in terms of physical infrastructure, equipment, drugs and supplies and human resources in 10 districts of Madhya Pradesh.

The present study found that while certain aspects like electricity and water supply were adequate at most of the facilities, there

Table 3: Pre- and post-operative areas					
Variable	Category	Frequency n (%)			
Waiting area (n=30)	Hospital corridor	3 (10%)			
	OPD area	4 (13.3%)			
	Outside OT	9 (30%)			
	Pre-operative area	5 (16.6%)			
	NA (As there were no clients)	9 (30%)			
Post-operative area (n=16)*	General ward	2 (12.6%)			
	Post-operation waiting area	11 (68.8%)			
	Corridor	3 (18.8%)			
Postoperative patient bed (n=16)*	Yes, each had a separate bed	2 (12.55%)			
	Patients were on a mattress on floor	5 (31.3%)			
	More than one patient on each bed	2 (12.5%)			
	Patient was lying on floor/carpet	7 (43.8%)			

\*n=16 as only these facilities were open and working on the day of the visit. OPD=Outpatient department, OT=Operation theatre

were gaps in cleanliness, presence of functional toilets and proper space for examination and counselling. Findings similar to the ones in this study regarding the toilets have been found in other studies[16-18], wherein, according to the study done by Kumari et al. in Lucknow, the availability of toilets even at the tertiary level was found to be at only a meagre 44.7%, and in the study done by Sodani et al. in Madhya Pradesh, toilets were found to be unavailable at seven DHs, one civil hospital and 11 CHCs. Also, Shriram et al., in their study, found that only 66% of the health facilities had toilets with running water. [19] This is a deafening blow to the health system in the country, as well as it defeats the purpose of the cleanliness programme "Swachch Bharat Abhiyan" and the public health initiative "Kayakalp". [20] As the sterilisation services are mostly female-oriented, women spend roughly about a day at the facility, notwithstanding the fact that they are also accompanied by women bystanders. Hence, the unavailability of adequate toilet facilities is of grave concern, as it might lead to the beneficiaries and their attendants getting disgruntled by the poor services, and in turn, them spreading a bad word in the community, which might sink an eventual disregard into the minds of other people for the government's health system in total. This, urgently, calls for a solid step by the policy-makers towards the problem.

The lack of availability of appropriate waiting area, post-operative area, IEC material, complaint box and patients charter were other serious issues with the majority of facilities. Patients and their attendants have to wait in other areas, in the absence of a waiting area. It makes the areas overcrowded, [17,18] and adds to the anguish of the patients and the attendees, who usually have to walk for long distances in the heat of this tropical country to use health services, as well as it creates chaos in a busy health centre. The lack of focus on IEC material and activities has also been found in another study by Thakur et al. in the health centres of Punjab and Haryana.<sup>[21]</sup> The patients' charter is a necessary item and a health right of the beneficiary that should be present in every CHC, according to the Indian Public Health Standards (IPHS) guidelines; however, it was not found so in this study. [22] Also, the lack of complaint boxes is not a strange finding particular to this study only. It has also been described in other studies done by Bhattacharya et al., Shriram et al. and Peters et al. [18,19,23]

Similar findings have been reported in studies done by Achyut *et al.* and Mishra *et al.* <sup>[9,19,24]</sup> The lack of compliance to the standard norms for the waiting areas, patients' charter and complaint boxes, which are small but key elements in the architecture of patient care, will lead to a fall in the clientele of public health facilities and prevent them from accessing these facilities. This is another point that needs to be addressed by government officials as soon as possible.

Almost all facilities have OT where sterilisation procedure can be done but only 13 out of the 30 facilities had operations table with Trendelenburg facility. Similar findings have been reported by Mishra *et al.* in their study for the assessment of the infrastructure at government healthcare facilities for providing family welfare services in Odisha.<sup>[24]</sup> Also, about one-third of the facilities reported poor condition of shadow-less lamp (short circuit, dim light), which is in concurrence with the findings of Achyut *et al.*<sup>[9]</sup>, who assessed the quality of care in provision of female sterilisation services in his study in Bihar. He stated that at all three stages of the sterilisation procedure, including making the incision, closing it and manipulating the uterus, proper lighting is essential, so its availability is important for providing quality services.<sup>[9]</sup>

Though emergency resuscitation equipment was available at most of the facilities, significant shortage of the minilap/laparoscopic/ NSV set was found at most of the facilities. This affected service delivery, which is similar to the findings reported by other studies. [24] This could be because of the fact that most of the facilities had visiting operating surgeons, who carry surgical instruments with them. An overall poor record-keeping was seen. The major limitation of the study was that, during the study period, despite 3-4 days follow-up of every facility, sterilisation procedures were observed in only 16 facilities.

The operations table with the Trendelenburg facility is a must in all facilities, as it prevents surgical complications arising from wrong postures during surgery. The lack of this is a major barrier in the smooth functioning of facilities providing sterilisation services. Hence, the policy-makers should realise this fact early if the goal of population stabilisation with access to safe sterilisation services is to be achieved.

# **Conclusion and Recommendations**

The present study found that the infrastructure in the facilities was substandard with respect to the waiting areas, toilet facilities and operating tables with Trendelenburg facilities. Additionally, there was a lack of other facilities, which are included in the operational guidelines for facilities providing fixed day sterilisation services. To make things better, the waiting areas could be made to accommodate more people and made more comfortable to reduce the anguish and stress of the patients. Satisfactory

toilet facilities would help to gain the trust of the people with the public health system. The actions and decisions made by the policy-makers and public health officials in accordance with the requirement of the standards will lead to better clientele and public satisfaction and help achieve population control safely and firmly.

#### Acknowledgements

We acknowledge and thank the Principal Secretary, Commissioner, Mission Director, National Health Mission and the Department of Public Health and Family Welfare, Government of Madhya Pradesh for the administrative support.

We would also like to thank Mrs. Kirti Iyengar, (National Programme Officer) and Dr. Nilesh Deshpande (State Programme Officer) and the United Nations Fund for Population Activities, India for their technical support.

# Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

# Financial support and sponsorship

UNFPA, Madhya Pradesh, India.

#### **Conflict of interest**

There is no conflict of interest.

### References

- WHO | India [Internet]. WHO. [cited 2019 May 23]. Available from: http://www.who.int/countries/ind/en/.
- Population growth (annual %) | Data [Internet]. [cited 2019 May 23]. Available from: https://data.worldbank.org/ indicator/SP.POP.GROW?locations=IN.
- 3. Population Growth: Trends, Projections, Challenges and Opportunities [Internet]. [cited 2019 May 23]. Available from: http://planningcommission.nic.in/reports/wrkpapers/wp\_hwpaper.pdf.
- Verma MM. Population control programme in India: Required interventions for improving the effectiveness of the primary health care delivery system. J Health Manage 2010;12:373-89.
- National Family Planning Programme [Internet]. Hum Do | Family Planning. 2017 [cited 2019 May 23]. Available from: https://humdo.nhp.gov.in/about/national-fp-programme/.
- Rao M. From Population Control to Reproductive Health: Malthusian Arithmetic. New Delhi; Thousand Oaks, Calif: Sage Publications; 2004. p. 287
- Chaurasia A, Singh R. Forty years of planned family planning efforts in India. IUSSP International Population Conference [Internet]. Busan: IUSSP International Population

- Conference, Bussan, Republic of Korea; 2013. Available from: https://iussp.org/sites/default/files/event\_call\_for\_papers/IUSSP\_40FP\_0.pdf. [Last cited on 2019 Jul 23].
- 8. India Fact Sheet, National Family Health Survey 2015-16 [Internet]. [cited 2019 May 24]. Available from: http://rchiips.org/nfhs/pdf/NFHS4/India.pdf.
- 9. Achyut P, Nanda P, Khan M, Verma R. Quality of Care in Provision of Female Sterilization and IUD Services: An Assessment Study in Bihar [Internet]. New Delhi: International Center for Research on Women; 2014 [cited 2019 May 23]. Available from: https://www.icrw.org/wp-content/uploads/2016/10/QoC-Bihar-Report-FINAL.pdf.
- Standard Operating Procedures for Sterilization Services in Camps [Internet]. Family Planning Division, Ministry of Health and Family Welfare, Government of India; 2008 [cited 2019 May 23]. Available from: http://dhs.kerala.gov.in/ docs/pdf/fwiec4.pdf.
- 11. Fixed Day Static Approach in Sterilisation Services Operational Guideline.pdf [Internet]. Family Planning Division, Ministry of Health and Family Welfare, Government of India; 2008 [cited 2019 May 23]. Available from: http://www.nrhmorissa.gov.in/writereaddata/Upload/Guidelines/Fixed%20 Day%20Static%20Approach%20in%20 Sterilisation%20Services%20Operational%20Guideline.pdf.
- 12. Mathur M, Goyal RC, Mathur N. Quality assessment of family planning sterilization services at health care facilities: Case record audit. J Clin Diagn Res 2017;11:LC07-9.
- 13. Family Planning. Annual Report 2017-18 [Internet]. Ministry of Health and Family Welfare, Government of India; 2019 [cited 2019 May 23]. Available from: https://mohfw.gov.in/sites/default/files/06 Chapter.pdf.
- 14. Family Planning. Annual Report 2015-16[Internet]. Ministry of Health and Family Welfare, Government of India [cited 2019 May 24]. Available from: https://mohfw.gov.in/sites/default/files/56324455632156323214.pdf.
- 15. Bruce J. Fundamental elements of the quality of care: A simple framework. Stud Fam Plann 1990;21:6191.
- Sodani PR, Kumar RK, Srivastava J, Sharma L. Measuring patient satisfaction: A case study to improve quality of care at public health facilities. Indian J Community Med 2010;35:52-6.
- 17. Kumari R, Idris M, Bhushan V, Khanna A, Agarwal M, Singh S. Study on patient satisfaction in the government allopathic health facilities of Lucknow district, India. Indian J Community Med 2009;34:35-42.
- 18. Bhattacharyya S, Issac A, Rajbangshi P, Srivastava A, Avan BI. "Neither we are satisfied nor they"-users and provider's perspective: A qualitative study of maternity care in secondary level public health facilities, Uttar Pradesh, India. BMC Health Serv Res 2015;15:421.
- Sriram S. Availability of infrastructure and manpower for primary health centers in a district in Andhra Pradesh, India. J Family Med Prim Care 2018;7:1256-62.
- 20. Guidelines for Implementation of "Kayakalp" Initiative [Internet]. Ministry of Health and Family Welfare, Government of India [cited 2019 May 27]. Available from: http://tripuranrhm.gov.in/QA/Guideline/0101201901.pdf.
- 21. Thakur JS, Jaswal N, Grover A. Is focus on prevention missing in national health programs? A situation analysis of IEC/BCC/Health promotion activities in a District setting of Punjab and Haryana. Indian J Community Med 2017;42:30-6.

- 22. Indian Public Health Standards (IPHS) Guidelines for Community Health Centres [Internet]. Directorate General of Health Services, Ministry of Health & Family Welfare, Government of India [cited 2019 May 27]. Available from: http://health.bih.nic.in/docs/guidelines/guidelines-community-health-centres.pdf.
- 23. Peters DH, Muraleedharan VR. Regulating India's health services:
- To what end? What future? Soc Sci Med 2008;66:2133-44.
- 24. Mishra S, Panda B. Assessment of infrastructure at government healthcare facilities for providing family welfare services in Odisha. [cited 2019 May 23]; Available from: https://www.academia.edu/27703186/Assessment\_of\_infrastructure\_at\_government\_healthcare\_facilities\_for\_providing\_family\_welfare\_services\_in\_Odisha.