

REVIEW

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Measuring adolescent friendly health services in India: A scoping review of evaluations

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Abstract

Background: Initiatives to promote adolescent friendly health services (AFHS) have been taking place in India and many low- and middle-income countries for nearly two decades. Evaluations of these initiatives have been placed in the public arena from time to time, but little is known about what they say about the overall situation on AFHS in India. This study aimed to describe how efforts to provide AFHS in India have been evaluated, how well they have been evaluated, and what their findings and implications are.

Methods: We conducted a scoping review of evaluations of AFHS initiatives in India from 2000 to 2014. An electronic search was carried out in Medline and EMBASE. A manual search of grey literature was also performed, and experts were contacted in order to obtain additional manuscripts and reports.

Results: Thirty evaluation reports were identified representing a broad geographic distribution. Evaluations have focused on government-sponsored AFHS programmes or independent non-governmental organization (NGO) initiatives to strengthen government services. The evaluations primarily measured programme outputs (e.g. quality and service utilization) and health behavioural outcomes (e.g. condom use). Study designs were commonly descriptive or quasi-experimental. Most evaluations found improvement in quality and utilization of services, and some demonstrated an increase in adolescent knowledge or health behaviours. Few measured positive project/programme results such as older age at first pregnancy. Strengths of evaluations were clear objectives, frequent use of multiple data sources, and assessment of programmatic outputs as well as health outcomes. Weaknesses were lack of consistency and quality.

Conclusions: Our findings confirm that a number of evaluations of AFHS initiatives in India have been carried out. They point to service quality and in behavioural improvements in adolescents. However, their lack of consistency hinders comparison across sites, and their uneven quality means that their findings need to be interpreted with caution.

Keywords: Adolescent friendly health services, Contraception, Adolescent sexual and reproductive health, Reproductive health services, Systematic review, India, Programme evaluation

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Plain English summary

Adolescents make up one-fifth of India's population. India's government has prioritized efforts to make health services more adolescent friendly. A number of individual studies and evaluations have been carried out and published, but little is known about what they say as a whole. The purpose of our study was to explore the range and results of evaluations of adolescent friendly health services in India.

We conducted a review of publicly-available evaluations of adolescent friendly health service programmes or projects in India from 2000 to 2014. We found thirty evaluations describing initiatives led by government agencies and non-governmental organizations. We summarized the methods and findings of these evaluations using a standard framework. We learned that evaluations were highly variable in measuring programme processes, outputs, or health impacts. Most evaluations found improvement in quality of services and some showed an increased in adolescents' knowledge and sexual health behaviours.

Our study concluded that evaluations of adolescent friendly initiatives are taking place in India and demonstrating positive health benefits for adolescents. We recommend that evaluation methods be standardized to ensure quality and comparability.

Background

Improving the reproductive and sexual health (RSH) of adolescents is a key component of India's National Health Mission [1, 2]. This paper examines evaluations of government and non-government organization (NGO) initiatives to increase access to quality RSH services by adolescents and young people in India.

Adolescents constitute over 20% of India's population. These young people face a number of RSH problems, such as risk for early and unplanned pregnancy and vulnerability to sexually transmitted infections, including HIV [3, 4]. India's Ministry of Health and Family Welfare (hereafter called "the Ministry") addressed these problems in 2005 by formulating its national Adolescent Reproductive and Sexual Health (Adolescent RSH) policy and guidelines within the context of the National Health Mission [5]. Measures were subsequently taken to support their implementation [1]. Officials in some states and union territories began applying the Adolescent RSH policy and guidelines, and NGOs escalated their efforts as well.

A growing body of reports and articles have documented efforts to make RSH services more equitable, available, acceptable, appropriate, and effective—all characteristics of adolescent friendly health services (AFHS) as defined by the World Health Organization (WHO) [6]. In its implementation guide for ARSH, the Ministry enumerated seven standards for providing AFHS (Table 1) [1]. In 2014, the Ministry launched *Rashtriya Kishor Swasthya Karyakram*, the National Adolescent Health Programme), which expanded the scope of adolescent health programming beyond RSH but maintains AFHS in clinics as a key element of its list of programme components [7]. To date, there is limited knowledge of how these policies and programmes to increase access to quality RSH services have been evaluated and what lessons have been learned thus far.

Our study examined how these expanded efforts to promote AFHS have been evaluated in order to map efforts thus far and identify strategies to perform these

Table 1 Standards from Government of India Implementation Guide for Adolescent Friendly Health Services ^a

Standards	Issues covered
1. Availability of specific service package	<ul style="list-style-type: none"> • Dedicated ARSH clinic (Preventive, Promotive, Curative, and Referral) • Outreach programme for adolescents
2. Delivery of effective services	<ul style="list-style-type: none"> • Adequate manpower • Guidelines and Standard Operating Procedures • Equipment and supplies
3. Conducive environment at clinic	<ul style="list-style-type: none"> • Location and timing • Basic amenities • Privacy and confidentiality
4. Sensitive and non-judgemental providers	<ul style="list-style-type: none"> • Attitude • Communication skills
5. Enabling environment in community	<ul style="list-style-type: none"> • Sensitization • Distribution of Information Education & Communication (IEC) material
6. Adolescents informed on availability of services	<ul style="list-style-type: none"> • Signboard • IEC in school, public places • Folk and multimedia
7. MIS in place	<ul style="list-style-type: none"> • Recording and reporting • Supervision

^a (National Rural Health Mission. Implementation guide on RCH II adolescent reproductive sexual health strategy for state and district programme managers [Internet]. 2006. Available from: http://www.searo.who.int/entity/child_adolescent/topics/adolescent_health/rch_asrh_india.pdf

evaluations. Specifically, we sought to answer the following questions:

- Where and when have evaluations/studies of AHFS initiatives been carried out?
- Who has conducted these evaluations/studies?
- For what purpose have these evaluations/studies been conducted?
- What design and methods have been used to carry out these evaluations/studies?
- What was the nature and extent of facilities and clients included in these evaluations/studies?
- What were the main findings of these evaluations/studies?

Our goal is to improve the quality and impact of population-based AFHS efforts and to gain knowledge for implementation in other settings.

Methods

Literature search

We conducted a systematic search of publicly available peer-reviewed articles and reports from January 1, 2000 to August 1, 2014. We searched Medline and EMBASE electronic databases using medical subject heading (MeSH) terms “adolescent health services” or adolescent and young adult age-limited “health services,” “preventive health services,” or “school health services.” We restricted our search to peer-reviewed studies and evaluations performed in India. Detailed search strategies are in Appendices 1 and 2. We used the same key words to search websites of organizations engaged in adolescent health service activities in India, including United Nations agencies, international and indigenous NGOs, bilateral agencies, and foundations. In addition, we searched the websites of professional associations

and the Ministry at national and state/district levels for relevant publications. Finally, we reviewed the reference lists of articles and reports obtained to identify any additional publications that may have been missed.

Inclusion and exclusion criteria

We established inclusion criteria as any report that described an evaluation of an initiative to improve health services for adolescents in India. We included initiatives in all types of health facilities-including those for all ages and those dedicated to adolescents and those operated by government or NGOs. Our primary focus was on facility-based initiatives directed at individuals ten to nineteen years, and on health service provision (i.e. the provision of preventive, curative and rehabilitative services by a trained health worker). We defined evaluation as “the systematic collection of information about the activities, characteristics, and outcomes of programmes [for adolescents] to make judgments about the program, improve program effectiveness, and/or inform decisions about future program development” [7]. We defined research as “the scientific investigation of how social factors, financing systems, organizational structures and processes, health technologies and personal behaviours affect adolescent access to health care, the quality and cost of health care, and health and well-being of adolescent recipients of services” [8]. Because we were primarily interested in results of programmes, we did not include formative or input evaluations that informed programme development and focused our review instead on a range of evaluation types from process to output, outcome and impact evaluations (see Fig. 1). We used standard Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram to describe the inclusion and exclusion process [9]. PRISMA is an evidence-based flow diagram of the minimum

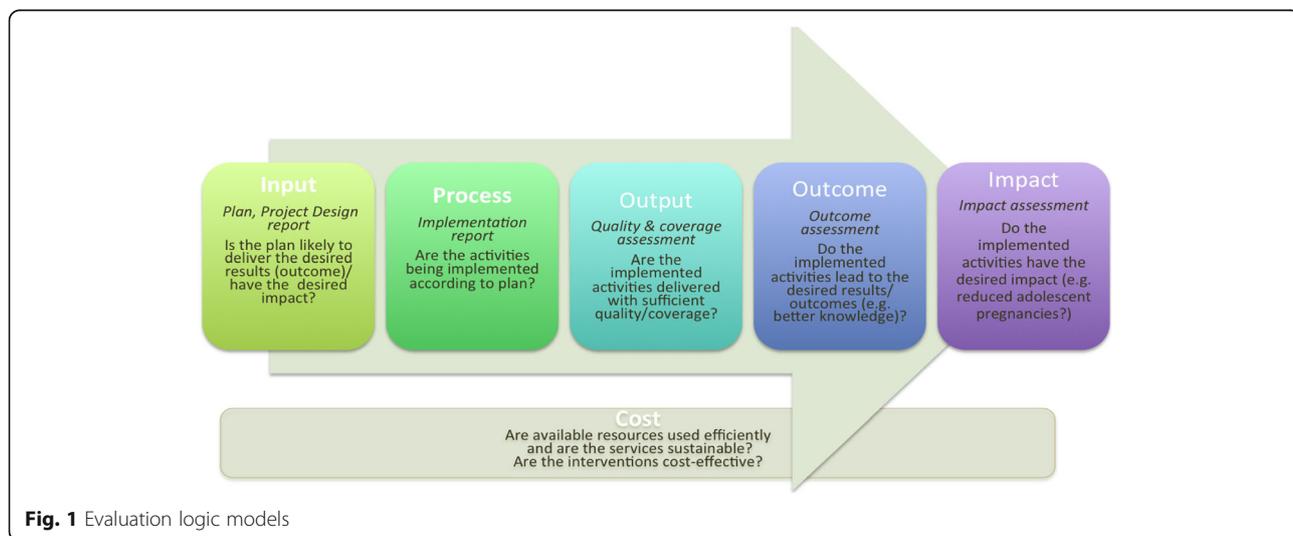


Fig. 1 Evaluation logic models

items for reporting in systematic reviews and meta-analyses designed to help authors improve reporting. Human subjects review was not necessary given that our review protocol did not directly involve human participants.

Data analysis

Two authors reviewed all reports and entered data from those meeting initial inclusion criteria into an evidence table adapted from PRISMA statement elements [10]. We categorized data based on geographic region where the study/evaluation was conducted, year, institution/organization that carried it out, its objectives, its design and methods (see Table 2 for a definition of the types of evaluation or research designs employed across the selected evaluations), nature of health facilities (hospital/clinic, government/non-government), and number of health facilities and/or users studied. We identified the type of study/evaluation they employed organized them into four broad categories (see categories illustrated in the logic model Fig. 1). These categories included findings (when present for each category) specific to process (programme design, fidelity of implementation of the programme), outputs (including quality and coverage/reach of services), health behaviour outcomes, and programme results/impact measured by evaluation. Data entered into the table were discussed with all authors to reach consensus on characteristics and findings of each evaluation. Following data abstraction, we reviewed trends specific to the categories described above and developed primary results for each category through discussions among authors.

We utilized the Revised Standards for Quality Improvement Reporting Excellence to assess the quality of each publication [11]. The SQUIRE guidelines were developed and refined through a systematic vetting process with input from an expert panel and through public feedback [12, 13] and provide a framework for reporting new knowledge about how to improve healthcare. Two authors rated each evaluation using an adapted quality assessment scoring approach where each adapted SQUIRE criteria met by an evaluation report resulted in

Table 2 Evaluation or study designs

Descriptive: Describes client or programme/project characteristics, service utilization, client satisfaction, and program processes, outputs, and outcomes without a comparison group/site.

Quasi-experimental: Compares an intervention group/site to a control group/site without randomization or compares an intervention group/site to itself using measurements pre- and post-implementation of programme/project.

Experimental: Compares an intervention group to a control group using randomization.

Feasibility testing: Evaluates and analyses the potential of a proposed programme/project.

1 point. A maximum score for meeting all criteria was 15. Two authors independently scored each report, and mean scores and inter-rater reliability were calculated and compared using a Mann–Whitney comparison and kappa statistic.

Results

We identified 161 publications in our initial database search and thirty-three additional publications from our grey literature search. The process we used to move from this to the thirty presented here is described using a PRISMA flow diagram (Appendix 3). After removing duplicates, we screened titles and abstracts of 194 publications, of which 141 were excluded. Of the remaining 53 full-text articles and reports reviewed, we excluded twenty-three based on: not examining health service provision ($N=14$), not specific to adolescents or adolescent-friendly health services ($N=5$), study/evaluation of programme distributing a health commodity (e.g. iron supplementation) outside of clinical service context/venue ($N=3$), or other ($N=1$ non-systematic review). Of the remaining thirty publications, eighteen were published as reports and twelve as peer-reviewed research studies. Characteristics and main findings of evaluation reports (labelled with letters A–S) are found in (Tables 3 and 4) and of peer-reviewed articles (labelled with numbers 1–12) in (Tables 5 and 6), respectively.

Where and when have the evaluations/studies been carried out?

We found a broad geographic distribution of the thirty studies/evaluations. We identified eight in Maharashtra, five in Bihar, three in Haryana, two in Delhi, Gujarat, and Uttar Pradesh, and one each in Odisha, Rajasthan, and Uttarakhand. We also identified five that covered multiple states and union territories. Some evaluations/studies analysed data from the same project (e.g., PRA-CHAR), at different time points and with varying study designs. See Fig. 2 for a map illustrating where specific evaluations/studies were carried out. The majority of reports/articles were published in the latter half of the inclusion time period of 2000 to 2014 with only five (A, B; 1,2,3) published before 2008. Time from AFHS implementation through data collection to publication of report, when indicated, ranged from 1 to 6 years.

Who has conducted these evaluations/studies?

NGOs conducted fourteen of the thirty evaluations/studies (46%). Of those, five (D,M,N; 3,12) were conducted by indigenous NGOs and nine (A, B, I, R; 1,5,8,9,11) by international NGOs. Other bodies included academic institutions (S, F, K, P, Q, S; 2,4,6,7,10), consulting agencies (E,G,L), a government (C) or a

Table 3 Characteristics of evaluations (N=18)

ID	LOCATION (State: district-block or villages)	YEAR	ORGANIZATION(S) PERFORMING ("BY") AND REQUESTING ("FOR") EVALUATION	OBJECTIVE OF EVALUATION	PROGRAMME EVALUATED	EVALUATION DESIGN	EVALUATION METHODS	FACILITY TYPE EVALUATED	SCOPE OF EVALUATION
A [42]	Delhi: Peri-urban slums (district not specified) Madhya Pradesh: Vadodara, Gujarat Gujarat: Indore Ahmedabad	2001	BY: Indigenous NGO (Aarogya: Centre for Health-Nutrition Education and Health Promotion based in Fatehganj, Vadodara, Gujarat) FOR: International NGO (The Centre for Development and Population Activities (CEDPA))	To measure behaviour change among participants of a reproductive health promotion initiative (Better Life Options) in areas of education, engagement in income-generating activities, decision making mobility, self-esteem/self-confidence, empowerment, fertility, age of marriage, child spacing, use of contraceptives, health seeking behaviour as compared to non-participants	Better Life Options Programme components: (1) Building individual capacity through literacy promotion and linkages with formal education (2) Providing family life education (3) Providing vocational skills training (4) Providing age-appropriate general and reproductive health services. (5) Social mobilization through advocacy and community involvement	Quasi-experimental: post-implementation comparison of programme participants and non-participants in regards to behavioural and health outcomes	Post-implementation structured interviews with programme participants and non-participants using two questionnaires	Type of health facilities within intervention not specified	Number of facilities and adolescent clients using those facilities not specified
B [43]	Delhi: Slums of South Delhi and East Delhi Haryana: Mewat - 5 villages Madhya Pradesh: 4 unspecified districts	2003	BY: International NGO (CEDPA) and indigenous NGO partners (PRAYATIN in slums of South Delhi, YWCA of India in slums of East Delhi, Society for Promotion of Youth and Masses (SPYM) in slums of Delhi and 5 villages in Haryana, Bhartiya Gramin Mahila Sangh (BGMS) in 4 districts of Madhya Pradesh FOR: International NGO (CEDPA)	To measure the results of the "Adolescent-Friendly Reproductive Health Services Programme" on knowledge and health outcomes of participating adolescents	ENABLE Project: 16 month pilot programme to deliver "Adolescent-Friendly Reproductive Health Services" through 4 NGOs in 3 states of India (Delhi, Haryana, Madhya Pradesh). In addition to traditional Better Life Options programme components (above), ENABLE provided partner organizations opportunity to integrate health services within programme by engaging part-time doctors and lab technicians	Quasi-experimental: Pre- and post-implementation comparison of participants' perception, knowledge and attitudes regarding ARSH issues, further stratified by long-term and short-term intervention-type, and comparison of participants' haemoglobin levels	(1) Pre- and post-implementation survey assessing perceptions, knowledge, and attitudes (2) Pre- and post-implementation collection of height, weight, and haemoglobin to evaluate effectiveness of adolescent-friendly reproductive health services programme on adolescent female haemoglobin levels	Type of health facilities within intervention not specified	Number of facilities and adolescent clients using those facilities not specified
C [44]	Haryana: Yamuna Nagar - Kot, Kharwan,	2008	BY: National government agency (Government of India/Ministry of Health and	(1) To assess quality of adolescent-friendly health services (AFHS) at selected health facilities in Haryana and to	Delivering health services based on Government of India's ARSH Programme	Quasi-experimental: post-implementation comparison of ARSH clinics and other clinics	(1) Post-implementation interviews of MOs, ANMs, and adolescent clients	PHCs, CHCs, and SCS offering ARSH	Evaluation covered 10 ARSH clinics and 10 other sites in Both AFHS and non-AFHS sites included 2

Table 3 Characteristics of evaluations (N=18) (Continued)

Kalanaur, and Burhia blocks	Family Welfare (GoI/MHFW) FOR: National government agency (Govt of India/Ministry of Health and Family Welfare)	compare quality in AFHS facilities to non-AFHS facilities (2) To determine availability of key health system supports required to implement AFHS (3) To identify barriers to effective implementation of AFHS	in regards to quality indicators of AFHS	PHC and 8 SC evaluations 4 MOs, 16 ANMs, 120 adolescents were interviewed Denominator: ARSH had been implemented in 88 villages served by 4 PHCs, 2 CHCs, and 17 SCs, adolescent population served by facilities not specified
D Haryana [45] Yamuna Nagar	BY: Indigenous NGO (Society for Women and Children's Health (SWACH)) and state government agency (MHFW, Haryana State) FOR: State government agency (MHFW, Haryana State)	(1) To assess health problems of adolescents (2) To determine baseline data on coverage of key indicators (3) To assess use of SRHS by adolescents in relation to quality of care (4) To assess impact of interventions implemented in selected villages of the district	Quasi-experimental: post-implementation comparison of reported health problems, service utilization, and quality of services among adolescents villages with ARSH versus adolescents in comparison villages without ARSH	Evaluation covered 30 intervention villages + 30 comparison villages (with 20 adolescents in each) = 599 adolescents from 893 households in intervention villages, 594 adolescents from 868 households in comparison villages Denominator: Each cluster had three contiguous villages with an estimated adolescents population of 3000-5000
E Gujarat: [46] District(s) not specified	BY: Consulting agency (Centre for Operations Research and Training (CORT)) FOR: International NGO (UNFPA) and state government agency (MHFW, Gujarat State)	(1) To evaluate quality of ARSH services (2) To understand utilization pattern of ARSH services and client satisfaction and to analyse factors influencing or impeding service utilization (3) To validate need for special package of ARSH services among adolescents (4) To suggest ways to improve utilization of services and explore possibilities for expanding package of services	Descriptive: post-implementation cross-sectional evaluation	21 facilities visited, of which 17 (81%) were functional and able to be assessed 3 state officials, 9 district officials, 17 MOs, 19 grassroots level health workers 28 focus group discussions with adolescent boys and girls Denominator: 42 total ARSH facilities = 50% coverage; adolescent population served by facilities not specified
F [47]	BY: Academic institution/university	(1) To assess status of ARSH services	(1) Qualitative interviews with MOs, PHCs, SCs, and sub-	

Table 3 Characteristics of evaluations (N=18) (Continued)

Maharashtra: Raigad-Karjat block	(National Institute for Research in Reproductive Health (NIIRH)) FOR: National government agency (GoI/MHFW)	(2) To generate baseline data for identifying gaps in delivery of ARSH services (3) To provide recommendations for improving quality assessment tools	Government of India's ARSH Programme	Descriptive: post-implementation cross-sectional evaluation	ANMs, adolescent clients (2) Assessment of clinics using a checklist	divisional hospital (SDH) Interviews with 6 MOs, 11 ANMs, 24 adolescent clients Assessment of 10 health facilities (3 PHCs, 6 SCs, 1 SDH)
G Rajasthan: [48] Bhilwara, Chittorgarh, Alwar and Kaurali	BY: Consulting agency (India Institute of Health Management Research (IHMR)) FOR: Multilateral agency (UNFPA, Rajasthan State Office)	(1) To assess status of ARSH services in 4 districts in Rajasthan (2) To assess status of training of service providers in ARSH services (3) To assess availability of ARSH information for adolescents (4) To assess preparedness to improve and sustain provision of services	Delivering health services based on Government of India's ARSH Programme	Descriptive: post-implementation cross-sectional evaluation	(1) Interviews with health service providers and adolescent clients (2) Assessment of clinics using a checklist	Primary health care centers (PHCs), community health centers (CHCs), and district hospitals (DHs) 24 providers were interviewed 131 adolescents interviewed Denominator: 110 operating AFHCs in 4 selected districts among 8 districts where service package has been implemented. Adolescent population served by facilities not specified
H Maharashtra: [18] 33 districts not specified	BY: Multilateral agency (UNFPA) FOR: Multilateral agency (UNFPA) on behalf of multiple state governments throughout India (including Government of Maharashtra for this particular portion of report)	(1) To evaluate the functioning of the AFHCs (2) To assess service environment, status of training of service providers, and availability of information to adolescents with regard to ARSH services	Delivering health services based on Government of India's ARSH Programme	Descriptive: post-implementation cross-sectional study of quality of services	Specific methodology not specified	Number of facilities and adolescent clients using those facilities not specified
I Uttar Pradesh Madhya Pradesh Jharkhand Orissa Assam Jammu and Kashmir Tamil Nadu [49] (Districts not specified)	BY: Academic institution/university (Population Research Centre, Institute of Economic Growth) FOR: National government (Programme Evaluation Organisation Planning Commission/ Government of India)	To evaluate and assess availability, adequacy and utilization of AFHS in rural areas	Delivering health services based on Government of India's ARSH Programme	Descriptive: post-implementation cross-sectional study of quality of services	(1) Household survey (2) Facility survey	Type of health facilities within intervention not specified Facility survey covered 37 DHs, 74 CHCs, 148 PHCs, 296 SCs, and 296 villages over 37 districts in 7 states 25 households for the household survey in each selected village was based on identification of 5 households under each

Table 3 Characteristics of evaluations (N=18) (Continued)

<p>J Bihar: [50]</p>	<p>2011</p>	<p>BY: International NGO (Pathfinder International) FOR: International NGO (Pathfinder International)</p>	<p>To evaluate knowledge, attitude, and practice changes after Phase I and II of PRACHAR intervention as well as impact of PRACHAR IRH training</p>	<p>PRACHAR intervention: (1) Social environment building (2) Providing info on RH and services (3) Improving access to RH services: training formal and informal rural health service providers on RH issues and contraception; encouraging vulnerable populations to seek services, motivating chemists and village convenience shops to keep regular stocks of condoms and pills</p>	<p>Quasi-experimental: Pre- and post-implementation comparison of participants' contraception attitudes, knowledge, demand, and use</p>	<p>Pre- and post-implementation survey of participants</p>	<p>Type of health facilities within intervention not specified</p>	<p>Health facilities in intervention communities and number of adolescent participants using facilities not specified</p>
<p>K Orissa: [51]</p>	<p>2012</p>	<p>BY: Academic institution/university (India Council of Medical Research (ICMR)) FOR: ICMR</p>	<p>(1) To assess knowledge, attitude, and behaviour on reproductive health problems in adolescents care at AFHCS (2) To assess quality of care at AFHCS (3) To assess accessibility and utilization of health care services by adolescents</p>	<p>Delivering health services based on Government of India's Adolescent Reproductive and Sexual Health Programme</p>	<p>Descriptive: post-implementation cross-sectional study of quality of services</p>	<p>(1) Community-based survey of adolescents with measurement of height, weight, mid-upper arm circumference, haemoglobin of adolescent clients (2) Survey of stakeholders (community health workers school teachers) using questionnaires (2) Facility-based survey of providers</p>	<p>Adolescent friendly health clinics (type of facility not further specified)</p>	<p>Community sample in 2 districts included 720 households in Kalahandi, 657 households in Rayagada -Covered 858 (Unnagarh in Kalahandi) and 755 (Rayagada 420, Gunupur 335 in Rayagada) adolescents respectively 224 stakeholders interviewed (116 in</p>

of the following categories: those having pregnant woman, having lactating women, with children 1-5 years, with at least one chronic disease patient, and having utilized family planning services = 7400 households

Denominator: Total number of facilities and adolescent population served by these facilities not specified

Table 3 Characteristics of evaluations (N=18) (Continued)

L	Uttarkhand: [52] District not specified	2012	BY: Consulting agency (Futures Group International) FOR: Foreign government agency (USAID)	To compile a summary of numerous published and unpublished materials to capture best practices, lessons learned and recommendations developed over course of 2 years of work on ARSH within Innovation in Family Planning Services (IFPS) Projects and IFPS Technical Assistance Project (ITAP)	Quasi-experimental: Pre- and mid-intervention comparison of sexual and reproductive health knowledge and attitudes	(1) Questionnaire measuring SRH knowledge and behaviors among adolescents (2) Unspecified facility assessment tools	Type of health facilities within intervention not specified	Kalahandi and 108 in Rayagada 73 health service providers interviewed (30 in Kalahandi, 43 in Rayagada) Quality of care evaluated at 2 AFHCs in Kalahandi and 1 in Rayagada Denominator: Total number of facilities and adolescent population served by these facilities not specified 80 primary sampling units (PSUs) were selected by sampling 10 villages from 8 pilot blocks. 32 adolescents were selected from each PSU to include 2500 adolescents total in assessment Midterm assessment included 317 adolescents who had used at least one UDAAN services and 1273 who had not used any UDAAN service Denominator: Health facilities in intervention communities and number of adolescent participants using facilities not assessed
M	Uttar Pradesh: [53] Varanasi- Arajilme block, Bangalore- Hoskote block	2013	BY: Indigenous NGO (Research Unit at MAMTA-Health Institute for Mother and Child, Delhi) FOR: Not specified	To assess youth friendly health services from clients' perspectives and role of outreach activities in improving access to the services for purpose of potential upscaling	Descriptive: post-implementation cross-sectional study of quality of services	(1) Semi-structured interviews to measure demographics, time spent on client-provider interactions, perception regarding privacy and confidentiality, awareness about YIC activities, role of YIC, level of satisfaction (2) Focus group discussions to measure	Youth friendly health facilities not further specified	Consecutive sample of 120 clients from 4 selected clinics for exit interviews 8 focus group discussions (8-10 participants each) conducted among community members and young people Denominator: Total number of facilities and

Table 3 Characteristics of evaluations (N=18) (Continued)

<p>O</p>	<p>Uttar Pradesh: [54] Hardoi and Siddharth Nagar Bihar: Nalanda and Vaishali</p>	<p>2013</p>	<p>BY: Indigenous NGO (Research Unit at MAMTA-Health Institute for Mother and Child, Delhi) FOR: Not specified</p>	<p>To analyse key determinants of YFHS that influence client's satisfaction level in order to help decision makers implement programmes tailored to clients' perceived needs</p>	<p>Delivering health services based on Government of India's Adolescent Reproductive and Sexual Health Programme</p>	<p>Descriptive: post-implementation cross-sectional study of quality of services</p>	<p>privacy-confidentiality, attitude of adults towards adolescent concerns, roles of outreach activities in improving access to services (3) Assessment of clinics using a checklist</p>	<p>adolescent population served by these facilities not specified</p>
<p>P</p>	<p>Maharashtra: [55] Raigad - Karjat block</p>	<p>2014</p>	<p>BY: academic institution/university (National Institute for Research in Reproductive Health (NIRRH)/Indian Council of Medical Research (ICMR) FOR: State government (Government of Maharashtra)</p>	<p>To assess the quality of adolescent health related services in Maharashtra against the 7 ARSH standards established by Gol in 2005</p>	<p>Delivering health services based on Government of India's ARSH Programme</p>	<p>Descriptive: post-implementation cross-sectional study of quality of services Quasi-experimental: Time series comparison of health service utilization</p>	<p>(1) Structured interview questionnaires for staff and clients (2) Assessment of clinics using a checklist</p>	<p>Youth friendly health facilities not further specified Denominator: Total number of facilities and adolescent population served by these facilities not specified</p>
<p>Q</p>	<p>Maharashtra: [56] Raigad - Karjat block</p>	<p>2014</p>	<p>BY: academic institution/university (National Institute for Research in Reproductive Health (NIRRH)/Indian Council of Medical Research (ICMR) FOR: multilateral agency (WHO) and state government</p>	<p>To test (in one block of one district) the feasibility of a developed action plan designed to link ARSH and HIV services in two districts.</p>	<p>Linking Government of India's Adolescent Reproductive and Sexual Health Programme and HIV services</p>	<p>Feasibility testing: Observations on implementation of linking ARSH services and HIV services</p>	<p>Did not specify tools for testing feasibility interventions to link ARSH-HIV services</p>	<p>8 facilities included in evaluation: 1 SDH, 1 RH, and 6 PHCs Denominator: Total number of facilities and adolescent population served by these facilities not specified.</p>

Table 3 Characteristics of evaluations (N=18) (Continued)

<p>R Jharkhand: [57] Jamtara and Palamu districts Maharashtra: Chandrapur and Nashik Rajasthan: Bhilwara and Karauli districts</p>	<p>2014</p>	<p>(Government of Maharashtra) BY: International NGO (Population Council) FOR: National government (Government of India/ Ministry of Health and Family Welfare)</p>	<p>To identify approaches to enhanced service delivery through adolescent-friendly health centers through refinements in content of and approaches to training and to inform strategies to generate demand for services</p>	<p>Delivering health services based on Government of India's ARSH Programme</p>	<p>Descriptive: Post-implementation mixed-methods cross sectional study</p>	<p>(1) In-depth interviews with ASHAs, ANMS, counsellors, and medical officers (2) Observation of service delivery at AFHCs using mystery clients (2) Exit interviews with clients accessing services (4) Cross-sectional, community-based survey of adolescents</p>	<p>Adolescent friendly health centers in community health centers (CHCs), sub-district hospital (SDH), or rural hospitals</p>	<p>12 AFHCs were evaluated of total 180 AFHCs in Jharkhand, 140 AFHCs in Maharashtra, and unspecified number in Rajasthan (8 each in Jharkhand, Maharashtra, and Rajasthan) Exit interviews performed with 5 adolescents (4 in Jharkhand and 1 in Maharashtra) Community-based survey covered a proportional distribution of 2131 adolescents from 48 villages within the 3 states (736 from Jharkhand, 682 from Maharashtra, and 713 from Rajasthan) Denominator: Total number of facilities and adolescent population served by these facilities not specified</p>
<p>S Delhi: [58] All 9 districts</p>	<p>2013</p>	<p>BY: academic institution/university (Maulana Azad Medical College) and state government (Directorate of Family Welfare) FOR: Not specified</p>	<p>To evaluate availability, type and quality of facilities providing RH services to adolescents in public and private sector</p>	<p>Delivering health services based on Government of India's Adolescent Reproductive and Sexual Health Programme</p>	<p>Descriptive: post-implementation cross-sectional study of quality of services</p>	<p>(1) Semi-structured interviews with facility managers (2) Facility checklists (3) Questionnaires for service providers at primary, secondary, and tertiary health centers (4) Exit interviews with clients accessing services</p>	<p>Primary, secondary, and tertiary health centres</p>	<p>9 of 9 total district head quarters assessed for availability of services 4 of 9 total districts sample for quality of services: 39 of 39 total facility managers, 31 of 31 secondary and tertiary units, 70 of 250 primary units, and 936 of 907,710 adolescents</p>

Table 4 Characteristics of research studies (N=12)

ID	LOCATION	YEAR	ORGANIZATION(S) PERFORMING ("BY") AND REQUESTING ("FOR") STUDY	OBJECTIVE OF STUDY	PROGRAMME MESTUDIED	STUDY DESIGN	STUDY METHODS	FACILITY TYPE STUDIED	SCOPE OF STUDY
1	Maharashtra: [59] Dhamari village, Pune	2006	BY: International NGO (ICRW) and academic institution/university (KEM Hospital) FOR: International NGO (ICRW)	To test feasibility in rural context to provide married youth with integrated package of reproductive health care and counselling	Providing integrated package of: (1) Reproductive health information (2) Clinical referrals (3) <u>Reproductive and sexual health couples counselling</u>	Multiple designs: (1) Feasibility assessment: Observations on implementation of package of reproductive health education, care and counselling for rural married youth. (2) Descriptive: Post-intervention cross-sectional study of attendance levels of participants, focus group discussions and interviews with participants (3) Quasi-experimental: Pre- and post-test of couples' RSH knowledge	(1) Methods not specified (2) Analysis of attendance records and referrals made, and follow-up visits that occurred, evaluations (self and external) of community level educators, group discussions and individual interviews with participants (3) Pre- and post-implementation surveys to test couples' RSH knowledge	Type of health facilities within intervention not specified	Number of facilities and adolescent clients using those facilities not specified
2	Maharashtra: [60] Urban Mumbai	2006	BY: academic institution/university (National Institute for Research in Reproductive Health (NIRRH)) FOR: Not specified	To assess the reproductive health problems and help-seeking behaviour among urban school-going adolescents [in context of ongoing intervention in schools in urban Mumbai during 2003-04 aimed at creating model for school-based adolescent friendly services through Adolescent Friendly Center (AFC)]	Providing school-based adolescent friendly services through AFC (established on school premises, function 2 days/week for 2 hours/day; services include information provision, counselling, free medical exams, anonymous letterbox)	Descriptive: post-intervention cross-sectional study of students using adolescent friendly center and of clinic attendance trends	(1) Self-administered questionnaire and collection of biologic health data during camp (2) Focus group discussions with male and female students (3) Monitoring of attendance data from clinic	Outpatient clinic on a school premises	300 urban school-going adolescents participated (11-14 year olds) from a single outpatient clinic on a school premises. A separate evaluation (not included) was done for 300 15-19 year olds Details of school population from which this group was sampled not specified
3	Maharashtra: [61] 2 unspecified blocks in Ahmednagar	2006	BY: Indigenous NGO (Foundation for Research in Health Systems (FRHS)) and international NGO (International Center for Research on Women (ICRW))	To assess the effectiveness of social mobilization and health services strengthening to improve married adolescents' reproductive and sexual health knowledge and to	(1) Social mobilization strategy implemented through indigenous, community-based women's and youth organizations to provide structured, interaction and recurrent health education sessions on	Multiple designs: (1) Experimental: Communities were randomly assigned to social mobilization, strengthening of health services, both or neither and knowledge and utilization of services	(1) Pre- and post-surveys of young married women assessing knowledge and reported utilization of services (2) Post-implementation survey of husbands of young married women in	Type of health facilities within intervention not specified (Social mobilization activities involved indigenous, community-based women's and youth organizations with some district health staff, and	Number of facilities and adolescent clients using those facilities not specified

Table 4 Characteristics of research studies (N=12) (Continued)

4	Haryana/ Punjab: Sectors 19 and 38 of Chandigarh City	2008	BY: academic institution/ university (Post Graduate Institute of Medical Education and Research) FOR: Not specified	(1) To assess perceived health problems and help seeking behaviour of adolescents (2) To measure utilization of adolescent health clinics by adolescents	increase their access to and use of health services.	FOR: Indigenous NGO (FRHS) and international NGO (ICRW)	select reproductive health topics. (2) Strengthening health services was done by working with state government to address specific gaps in training local health officials	were compared between 4 arms (2) Descriptive: Post-implementation cross-sectional study of husbands in one study arm (3) Quasi-experimental: pre- and post-implementation qualitative comparison of mothers-in-law in one study arm	social mobilization arm involvement and awareness in women's reproductive health (3) Pre- and post-interviews of mothers-in-law in social mobilization arm assessing involvement and awareness in women's reproductive health	health service strengthening involved training of local health officials)
5	Bihar: [63] Nalanda, Nawada, Patna	2008	BY: International NGO (Pathfinder International) FOR: International NGO (Pathfinder International)	To assess effect of PRACHAR intervention on: (1) contraceptive demand and use and (2) related attitudes and knowledge	PRACHAR intervention: (1) Social environment building (2) Providing info on RH and services (3) Improving access to RH services: training formal and informal rural health service providers on RH issues and contraception, encouraging vulnerable populations to seek services, motivating chemists and village convenience shops to keep regular stocks of condoms and pills	Pre- and post-implementation comparison of participants' contraceptive attitudes, knowledge, demand, and use	Quasi-experimental: Pre- and post-implementation comparison of participants' contraceptive attitudes, knowledge, demand, and use	Pre- and post-implementation questionnaire	Type of health facilities within intervention not specified number of adolescent participants using facilities not assessed	Health facilities in intervention communities and participants using facilities not assessed
6	Delhi, West Bengal, and Chandigarh: [64] South West Delhi District,	2009	BY: Academic institution/ university (India Council of Medical Research (ICMR))	To examine whether adolescent friendly health centres (AFC) have increased the quality and access to	Delivering health services based on Government of India's ARSH Programme	Quasi-experimental design: Comparison of quality and utilization of ARSH with corresponding	(1) Interviews with key stakeholders (staff members, adolescents, parents)	ARSH in government health facilities and corresponding "control" outpatient clinics (e.g. obstetrics;	3 intervention sites in tertiary care hospitals located in medical colleges, all run	

Table 4 Characteristics of research studies (N=12) (Continued)

Chandigarh-Sector 32, Kolkata District of West Bengal state	FOR: National government agency (Ministry of Health and Family Welfare (MHFW) and multilateral agency (World Health Organization)	health services as per the client's perception	"control" outpatient clinics	(2) Review of relevant documents (not clear if a facility assessment was performed)	skin care) in government facilities	outreach programme in schools as well Each site evaluation included 4 staff member, 25 adolescent, and 25 parent interviews
7 Maharashtra: [65] Mumbai	BY: Academic institution/university (National Institute for Research in Reproductive Health (NIRRH) and state government agency (Municipal Corporation of Greater Mumbai) FOR: Not specified	To test the feasibility of delivering ARSH services within public sector of Mumbai and to evaluate scaled up ARSH services at other health facilities	Delivering health services based on Government of India's ARSH Programme	(1) Feasibility assessment: Observations on implementation of ARSH services within public sectors (2) Quasi-experimental: Pre- and post-scale up comparison of participants' SRH knowledge help-seeking behaviours and time series comparison of health service utilization	Government primary care health posts with subsequent scale-up to include secondary care level hospitals	Research phase questionnaire participants N = 1326 adolescents interviewed of 1565 total adolescents using services at 2 health posts) Scale up phase questionnaire participants N = 2164 of 3250 adolescents using services at 3 health posts)
8 Bihar: [66] Nalanda, Nawada, Patna	BY: International NGO (Pathfinder International) FOR: International NGO (Pathfinder International)	To estimate the impact of implementing the PRACHAR model in the reproductive health and FP programs in Bihar and Uttar Pradesh	PRACHAR intervention (see above)	Quasi-experimental: Comparison of projected population growth between intervention and non-intervention communities	Type of health facilities within intervention not specified	Health facilities in intervention communities and number of adolescent participants using facilities not assessed
9 Bihar: [67] Gaya, Nalanda, and Patna	BY: International NGO (Pathfinder International) and consulting agency (India Institute of Health Management Research (IHMR)) FOR: Foreign government agency (USAID)	To conduct retrospective analysis of PRACHAR phase I and II data to develop a better understanding of the impact of FP/SRH outcomes and analyse possible trends in gender norms, attitudes, practices related to SRH that may have changed over time as result of PRACHAR -To conduct qualitative research (thru FGDs) to explore possible	PRACHAR intervention (see above)	Multiple designs: (1) Quasi-experimental: Comparison of attitudes and health behaviours between intervention community participants and comparison community participants (2) Descriptive: post-implementation qualitative study	Type of health facilities within intervention not specified	Health facilities in intervention communities and number of adolescent participants using facilities not assessed Evaluation sample = 23,400 intervention participants, 3900 baseline comparison participants, 7200 endline participants. Adolescent Follow-Up Study sample: 1224 participants who had been exposed to

Table 4 Characteristics of research studies (N=12) (Continued)

10	Gujarat: [68] Ahmedabad	2012	BY: Academic institution/university (Department of Community Medicine, Smt. NHL Municipal Medical College, Ahmedabad, Gujarat) FOR: Not specified	To evaluate knowledge regarding AFHS among Anganwadi workers (AWWs) To evaluate improvement in knowledge and skills of AWWs at appropriate intervals after skill-based training To assess health status and knowledge, attitudes, and practices (KAP) of adolescent girls of Anganwadis	Provision of a didactic education session with power point presentation, uterus model and chalkboard on importance of adolescent health to 111 AWWs in order to improve health services based on Government of India's Adolescent Reproductive and Sexual Health Programme	<p>Multiple designs: Quasi-experimental: Pre- and post-intervention comparison of knowledge of Anganwadi workers</p> <p>Descriptive: Cross-sectional assessment of health status and KAP of adolescent girls</p>	Questionnaire measuring knowledge of Anganwadi workers Assessment tool to measure health status and KAP of adolescent girls not described	Type of health facilities within intervention not specified	Health facilities in intervention communities and number of adolescent participants using facilities not assessed Convenience sample of 111 AWWs for questionnaires 142 adolescent girls were assessed for health status and KAP (target population unknown)	PRACHAR (306 M, 306 F, baseline and endline) 21 FGDs with 196 participants (varied from young women and men, mothers, fathers, community influences, trainers, field workers)
11	Bihar: [69] Nalanda, Nawada, Patna	2012	BY: International NGO (Pathfinder International/Daniel et al) FOR: International NGO (Pathfinder International)	To assess the effect of intervention on age at marriage, contraceptive use before and after first birth, age at first birth	PRACHAR intervention (see above)	<p>Quasi-experimental: post-implementation comparison of behavioural and health outcomes between participants in intervention communities versus those in non-intervention communities</p>	Post-implementation structured interview using questionnaire to assess history of marriage, reproductive health knowledge, attitudes, and behaviours, and pregnancy outcomes	Type of health facilities within intervention not specified	Health facilities in intervention communities and number of adolescent participants using facilities not assessed	
12	Uttar Pradesh: [70] Arajilme block of Varanasi district and Hosakote block of Bangalore district	2013	BY: Indigenous NGO (Research Unit at MAMITA-Health Institute for Mother and Child, Delhi) FOR: Not specified	To describe features of the intervention and to investigate (1) the impact on improving awareness and utilization of services by adolescents and (2) the quality of ARSH services in the intervention districts	Delivering health services based on Government of India's ARSH Programme	<p>Descriptive: post-implementation cross-sectional study of quality of services comparing two intervention districts</p>	Community-based survey of adolescents Exit interviews questionnaire of adolescent clients -Structured facility questionnaire to measure staffing, training, infrastructure, supplies, and services -Measurement of health service utilization	Youth friendly health facilities not further specified	17/217 villages in Arajilme and 17/333 villages in Hosakote with 12 girls and 12 boys selected from each → total sample = 737 adolescents (383 M, 354 F) 120 clients from 4 selected clinics for exit interviews	

Table 5 Main findings of evaluations (N=18)

Findings from the evaluations of:						
ID	Design	Implementation	Outputs (quality and coverage)	Health behaviour outcomes	Health outcomes	Comments
Eg.	Project goal Project objectives Framework of design Key approaches and strategies Rationale or basis Key actors	Implementation plan Activities undertaken Key influences Monitoring plan Use of monitoring information Mid-course adaptations/changes	Pre-inputs: Training material, training of trainers, clinical monitoring (CM), CM training, supportive supervision (SS) material, SS training Inputs: Training of health service providers, making facilities AFHS, problem solving, SS Outputs: Improved quality of services Outcomes: Improved use of services	Effect on adolescent behaviour (sexual behaviour, condom/contraceptive use behaviour/health seeking behaviour)	Eg. nutritional status, early pregnancy and pregnancy related mortality and morbidity, STIs and HIV	Other evaluation dimensions: community support and adolescent demand, planning and management, institutionalisation, cost
A				Better Life Options participants were more likely to have received antenatal care during pregnancy (91% vs. 64%), received tetanus toxoid immunization during pregnancy (91% vs. 62), delivered in health facility (50% vs. 36%), received post-natal care (57% vs. 39%), and currently be using contraception (36% vs. 27%) Children of participants 12 months or older more likely to have received complete primary immunizations (63% vs. 32%) Better Life Options participants were more likely to report having given child oral rehydration salts during diarrhoea (42% vs. 12%)	Better Life Options participants had lower mean number of children (1.73 vs. 1.98) Better Life Options participants had lower rates of child deaths (RR=0.88)	Other social outcomes including age at marriage, level of education completed, literacy were also evaluated
B		Intervention was feasible (focus on general adolescent health very effective; programme faced little resistance from parents, programme implementers, schools)		Statistically significant (p<0.01) percent change (%Δ) in knowledge of modern methods of contraception (male/female sterilization 37.6%Δ, condoms 34.6%Δ, intrauterine device 25.0%Δ, desire for less than 3 children 13.1%Δ, knowledge about need for 3 antenatal care checkups%Δ Statistically significant (p<0.01) increases in	Statistically significant (p<0.01) reduction in proportion of participants with anemia (Hemoglobin<10 grams) from 86% to 20% among 10-14 years and 86% to 36% among 15-19 years Mean Hemoglobin level improved (9.0 grams/dL to 11.1 grams/dL in 10-14 years, 9.0 grams/dL to 10.7 grams/dL in 15-19 years)	

Table 5 Main findings of evaluations (N=18) (Continued)

			knowledge for each of 4 modes of HIV transmission (sharing needles 39.8% Δ , unprotected sex 30.1% Δ , mother to child transmission 32.3% Δ , blood transfusion with infected blood 35.0% Δ)
C	Evaluation identified programme implementation, noting that ARSH-related supplies were found to be available, but not uniformly being distributed to adolescents	<p>Difference in quality scores between ARSH and other clinics for each standard (statistical significance is not reported):</p> <ol style="list-style-type: none"> 1. Health facilities provide the specific package of health services that adolescents need: 65% in ARSH versus 22% in other 2. Health facilities deliver effective services to adolescents: 78% versus 39% 3. Adolescents find the environment at health facilities conducive to seeking treatment: 86% versus 33% 4. Service providers are sensitive to adolescent needs and are motivated to work with them: 94% versus 59% 5. An enabling environment for adolescents to seek services exists in community: 63% versus 12% 6. Adolescents are well informed about health services: 44% versus 1% 7. Management systems are in place to improve/sustain the quality of health services: 45% versus 13% <p>No apparent difference in performances of PHCs vs. SCs Most intervention sites progressing well towards meeting the standards</p>	
D		Awareness of AFHS 8x higher in intervention area than comparison	

Table 5 Main findings of evaluations (N=18) (Continued)

		<p>villages (68% versus 8%)^o</p> <p>Use of government health facilities was higher in intervention than comparison villages (55% versus 37%)^o</p> <p>Denial of contraceptive services was perceived by majority of adolescents in both intervention and comparison villages</p> <p>More adolescents in intervention villages understood explanations of health problems than in comparison (83% versus 42%)^o</p> <p>No major differences between groups in acceptability and availability of condoms</p>	
E	<p>Some centres were non-functional due to transfer of MO who was oriented about centre and lack of human resources</p> <p>Major challenges to monitoring exist</p>	<p>Utilization data (average number of adolescent patients/month) showed minimal utilization. Where records available, average 250 adolescent clients/month.</p> <p>Focus groups revealed that adolescent boys and girls are generally unaware of ARSH centres and/or services. Use of services related to RSH problems is limited due to lack of awareness and knowledge</p>	<p>Quality of health services based on provider report, not direct observation, and scoring performed by evaluation team</p>
F	<p>Only 1 facility (SDH) was "designated" AFHS at time of assessment</p>	<p>Proportion of 7 standards of ASRH services implemented at each facility ranged from 19% to 42%</p> <p>Single facility that had been designated AFHS (SDH in Karjat) scored 31%</p> <p>Most broadly implemented standard (57% of facilities met standard) was standard 4: "Service providers are sensitive to adolescent needs and motivated to work with them."</p> <p>Least implemented standard (1% of facilities met standard)</p>	<p>Positive feasibility of using quality assessment tools</p> <p>Comment that focus group discussions are needed to gather better inputs for standards V and VI</p>

Table 5 Main findings of evaluations (N=18) (Continued)

		was standard 6 ("Adolescents are well-informed about health services.")
G	83% of clinics had been functional for less than one year	42% maintained audio and visual privacy 58% had displayed boards and 25% had adequate signage No ARSH facilities were found to have at least 100 condoms or at least 10 cycles of Oral Contraceptive Pills available, 83% had Emergency Contraceptive Pills available 67% had access to ARSH guidelines Utilization of services low: 14.5% of adolescents interviewed had used clinic in past 6 months) Few providers felt adequately trained
H		53,137 adolescents (40% male, 60% female) accessed services provided by 73 clinics -Scope of services included contraceptive choices, handling concerns related to menstruation and gender-based violence, improving life skills, providing ante-natal services, treatment of Reproductive Tract Infections/Sexually Transmitted Infections Access and quality of services were quite limited (report did not provide data to support this)
I		Adolescent health care available in 85.4% of SCs in 7 different states School health programmes in 77% of PHCs and related facilities in different states ASHA participation in sensitizing adolescent girls was found to be unsatisfactory (Data not provided to support this)

Table 5 Main findings of evaluations (N=18) (Continued)

J	<p>If comprehensive intervention is discontinued, there is an initial decline in contraceptive use in both groups after activities end, then stabilizes at higher level than pre-intervention</p> <p>Longer duration of comprehensive intervention was associated with greater increase in contraceptive use (a more modest effect demonstrated over shorter (2-3years) period of time</p> <p>Joint exposure of young married couples to PRACHAR communications is more effective than exposure to men alone</p> <p>PRACHAR interventions led to increased contraceptive use among all socioeconomic and education groups, but highest impact in most disadvantaged</p>	
K	<p>AWW and ASHA stakeholders have more knowledge about health concerns/programmes meant for adolescents than did teacher and Panchayati Raj Institution members</p> <p>Quality of services most adequate in relation to facility measure (separate room, exam table, display boards, records/registers, weighing scale) and supply measures (condoms, Oral Contraceptive Pills, Emergency Contraception, etc.)</p> <p>Information Education Communication materials and outreach services, co-curricular education activities are lacking</p>	<p>Low SRH knowledge in adolescent community</p>
L	<p>Scale-up included changes based on findings from</p>	<p>Improved attitudes and behaviours related to</p>

Table 5 Main findings of evaluations (N=18) (Continued)

	evaluation of pilot intervention, including the addition of new service delivery points, shift in monitoring responsibilities, improvements in efficiency of services	reproductive and sexual health including decrease on preference for male child from 39.9% to 25.7% (p<0.01), increased awareness of legal minimum age of marriage for girls from 68.2% to 85.4% (p<0.01), and increased use of sanitary pads increased from 30.6% to 52.7% (p<0.01)
M	Majority (90%) of clients aware that YFHS provide services to young men and women separately on specific day/time 66% of clients visited YFHS to seek treatment for 3 key problems (menstruation, general illness, swelling/itching of genitals) Privacy not consistently ensured according to clients	
O	32% of interviewed clients reported satisfaction with AFHS Satisfaction was positively associated with female gender, higher education status, Hindu religion Multivariate model showed greater satisfaction associated with parental support (odds ratio = 4.4), much lower satisfaction associated with fear of privacy disclosure to parents (odds ration = 0.08) – this factor was more important than parental attitudes Client satisfaction did not vary by appropriateness of time given by provider, clients’ belief regarding confidentiality of information, provision of information request	
P	Raw quality scores showed steady improvement with average score of 83% across all 8 health	

Table 5 Main findings of evaluations (N=18) (Continued)

		facilities in 5th year of evaluation and 79% across 12 sub-centres. No statistical analysis of change in scores over time. Persistently low performance of standard II (effectiveness of health facilities, including equipment and supplies)			
Q	<p>Situation analysis informed development of the following interventions as a block action plan: (1) Refresher trainings for providers (2) Linkages with schools and community organizations (3) Standard operating procedures and management information systems (4) Demand generation through collaboration with education department (5) Mobile helpline service (6) Quality assessment programme evaluation at the end of each year to be performed by external evaluators-</p>	<p>Feasibility assessment of block action plan found that: (1) Adolescents will not come to clinic on a particular ARSH day, so clinic schedule shifted to “anytime approach” in the block (2) Medical camps for adolescents helped strengthen linkages with schools/colleges, parents, and teachers and have facilitated demand generated (3) Linkages with NGOs helped created awareness of ARSH services (4) Proactive involvement of education system and clear guidelines are essential (5) Referrals within the block are not helpful since quality at sub-district hospitals are not superior (6) Interventions with limited scope were peer volunteers, mobile line service, and an adolescent health committee (7) Clear cut guidelines on ARSH exist from Government of India, but no departments except health sector have specific policies for roles and responsibilities related to adolescents</p>	<p>Findings of quality assessment programme reported in separate evaluation document (43)</p>		
R		<p>Most health care providers had undergone some training or sensitisation on SRH issues relevant to adolescents – some within context of general training and</p>	<p><50% of surveyed men and <66% of surveyed women who experienced an SRH problem had sought advice and/or treatment, fewer (33%) for mental health concerns. Most sought treatment from</p>	<p>Report also summarizes the perceived health problems among adolescents surveyed as well as their preferences about health care providers and facilities</p>	

Table 5 Main findings of evaluations (N=18) (Continued)

	<p>others through special training programmes ASHA and ANM training more often focused on “safer issues” like nutrition and menstrual hygiene while counsellors and MOs also received training on sexual relations, infection, pregnancy, and abortion. Fewer training experiences with privacy, confidentiality, non-judgemental interaction, promotion of informed choice, and communication skills</p> <p>“Cascade approach” to training reaches large numbers, but not successful in building capacity on intractable aspects of service provision like building communication skills and overcoming discomfort in talking about SRH issues</p> <p>Gendered responses regarding what information adolescents should receive, most believed that information provision to girls should be mothers and female providers like ASHAs and ANMs while boys should get information from other males (MOs, counsellors, etc.)</p> <p>Providers generally observe that adolescents and youth do not access SRHS available at community level or at AFHCs at facility levels</p> <p>Based on exit interviews and mystery clients, suitability of services was mixed with most commonly cited complaint being lack of privacy</p>	<p>medical officers in government or private facilities.</p> <p>Adolescents reported limited interaction with frontline and community HCPs (ANMs, ASHAs, and AWWs)</p> <p>Awareness of AFHCs was low among adolescents (5% of young men and 8% of young women surveyed were aware of services), <1% had ever sought services</p>
<p>S</p>	<p>Data on health facilities providing ARSH services is sparse and only covers public facilities. There has been insufficient training of</p>	<p>Low awareness of ARHS problems and availability of service among adolescents in community</p>

Table 5 Main findings of evaluations (N=18) (Continued)

<p>providers of these services. Quality of services is poor due to lack of manpower, lack of trained manpower, space constraints, poor community participation, time constraints. Knowledge of medical care providers and majority of paramedical care providers was sufficient, however majority of paramedics reported lack of comfort in communicating with adolescent clients. Facility surveys reveal lack of optimum information education communication/ Behaviour change communication material, inadequate space for privacy, and long patient queues. 77% of facilities had adequate stock of key supplies. Adolescent exit interviews reiterated above issues and also reported long waiting times, stigma of being seen in facility, inappropriate clinic hours/days, and low understanding by family and community members for SRH needs</p>

multilateral agency (H). We found many partnerships between NGOs and state government agencies and also that most publications had multiple authors and contributors from different disciplines. The majority of reports/articles (A,B,D,E,F,G,I,L,P,Q,R; 1,3,6,7,9) involved a research/evaluation team that was external to the implementing agency.

For what purpose have these evaluations/studies been conducted?

Nearly all reports contained clearly defined objectives, often with multiple components. Common objectives were to assess the quality of health services provided to adolescents (*process: C,E,F,G,H,I,K,L,M,N,O,R,S; 6,10,12*), to assess changes in the utilization of health services by adolescents (*outputs: D,E,H,K; 2,3,4,12*), and to measure RSH knowledge of adolescents exposed to a programme

(*outcomes: B,J,K,L; 3,5,9,10*). Few studies/evaluations aimed to assess behavioural outcomes such as condom or contraception use (*outcomes: A, J;4,5*) or health outcomes such as age at first birth associated with programme exposure (*results/impact: 9,11*). One large multi-component project called PRACHAR was evaluated in multiple studies and reports which examined various outcomes including age at first birth, birth spacing, and haemoglobin levels of participants (*J; 5,8,9,11*). Only the PRACHAR project evaluated the impact on community or population level outcomes such as age at marriage and first birth.

What evaluation/study designs and methods have been used?

We observed a variety of designs used to perform these studies/evaluations, falling broadly into categories of descriptive, quasi-experimental, feasibility assessment,

Table 6 Main findings of research studies (N=12)

Findings from the studies of:

ID	Design	Implementation	Outputs (quality and coverage)	Health behaviour outcomes	Health outcomes	Comments
1	<p>Evaluation of project design: Project design of RSH counselling to married men and women, individuals or couples is feasible Pre-existing community perceptions and community level educators (CLE's) acceptability in community must be considered when choosing a CLE More than expected time and effort is required to train rural volunteers, prepare manual for them to use in field, and test, modify, and finalize activities) Continuous retraining was critical</p>		<p>Youth participation outputs: 89.3% attended at least 1 reproductive health education (RHE) session 76.2% attended 4 or more days of RHE 48.2% attended all RHE sessions Clinical attendance outputs: 70% received clinical referrals thru RHE 33.3% received clinic referrals through counselling 29% received counselling referrals through RHE 55% of those in counselling were coming for follow up</p>	<p>Knowledge and awareness outcomes: Men's and women's awareness of various health issues (including menstruation, delivery, contraception, abortion) increased overall, but not for other issues covered in sessions If individual did not attend a session, their awareness increased if partner did Qualitative data suggests couples discussed RSH issues outside of sessions</p>		
2			<p>Intervention of school-based AFHS increased client attendance from one year to next (43% to 60% among girls, 35% to 42% among boys)</p>	<p><u>Biologic measures at one year follow-up (no baseline recorded):</u> 93.5% of girls were anemic (mean haemoglobin 9.6 grams) 14.8% of girls were below 5th percentile and 4% of girls were above 95th percentile for weight, mean body mass index (BMI) 19.1 82.3% of boys were anaemic (mean haemoglobin 10.7 grams) 29.3% of boys were below 5th percentile and 0.6% were above the 95th percentile for weight, mean BMI 18.0</p>		<p>A medical checkup with emphasis on assessment of reproductive health and nutritional status detected almost same number of reproductive health problems as reported by participants in survey (no statistical analysis done) Disparities identified between those students who report health problems (72% of girls, 56% of boys), and those who voluntarily sought help at clinic at baseline (43% girls, 35% boys)</p>
3			<p>Reported percent change in health service utilization among young married women from baseline to endline: (*=significant) Higher use of spacing FP methods: social mobilization group (SM) 14.4*, government services group (GS) 14.1*, SM+GS 12.4</p>	<p>Percent change in awareness among young married women from baseline to endline of: -Need for full ANC services: SM 66.1*, GS 18.5 -Need for prenatal care: SM 129.5*, GS 43.5, SM +GS 24.6 Survey of husbands showed that most husbands were aware of wife's reproductive</p>		<p>Social mobilization relatively effective in improving young married women's RH knowledge (on its own or with other government services) Strengthening of government services alone did not perform significantly better than other sites on most outcomes Also showed improvement in</p>

Table 6 Main findings of research studies (N=12) (Continued)

	<p>More attendance to prenatal care check-ups: SM 40.5*, GS -17.8 -Higher use of high-risk delivery care: SM 4.7, GS 4.2, SM+GS 29.8* More having received treatment for reproductive or sexual infection symptoms: SM 79.5, GS 44.8, SM+GS 98.2*</p>	<p>health needs (in terms of maternal health), yet even knowledgeable husbands unlikely to be involved in maternal care due to social norms that discourage their participation (no significance testing performed) Interviews showed that mothers-in-law were more likely to be supportive by end of project than at baseline (no quantitative comparison performed)</p>	<p>husbands' and mothers-in-laws' attitudes regarding young married women reproductive health needs in terms of maternal health</p>
4	<p>Significantly more adolescents used school-based clinic services than dispensary-based (33% versus 13.5%, $p < 0.01$) The majority of students using school-based clinics were 13-15y (60%) versus the majority of students using dispensary-based clinics were 16-19 (40%), $p < 0.001$.</p>	<p>Majority of participants (80.8%) reported having a health problem during 3-months prior to survey. Of those, 38% were "psychological" problems (tension about career, studies, weight/height 64% of girls and 42.3% of boys sought help/care for health problems, but very few consulted a doctor (most approached friends or parents) Most common problems presenting to clinic were psychological (29%), general health problems (25%), and behavioural (16%) Significantly higher proportion of adolescents with psychological and behavioural problems reported in school-based clinic whereas higher proportion of medical problems were presented in dispensary based clinic ($p < 0.05$)</p>	
5		<p>Demand for contraceptive use increased from 25% baseline to 40% at follow-up in intervention community (unchanged in comparison) Contraceptive use odds ratio 3.8 comparison vs. comparison communities</p>	

Table 6 Main findings of research studies (N=12) (Continued)

6	<p>Satisfaction level of clients in ARSH clinics varied by site: Significantly higher proportion of ARSH clients at Chandigarh reported being very satisfied with service vs. those at other clinics (90% vs. 66%, p=0.004) No significant differences between ARSH and other clinics in Delhi or Kolkata.</p> <p>Accessibility of ARSH clinics varied by site: Significantly higher proportion of ARSH clients at Chandigarh described easy accessibility of service vs. those at other clinics (70% vs. 54.3%, p value not reported) No significant differences between ARSH and other clinics in Delhi or Kolkata. ARSH clients in Chandigarh and Kolkata more frequently described comfortable waiting area (Chandigarh 50% vs. 34.4%, p=0.04, Kolkata 32% vs. 10.2, p=0.003), Health care providers were generally better reviewed by users in AFHCs than other clinics, no significance levels reported.</p>	<p>Knowledge that fertility varies during menstrual cycle and agreement that early child birth can be harmful, contraceptive use is necessary and safe for delaying first births higher in interventional than comparison communities (odds ratio 1.6-3.0)</p>	
7	<p>Strategy of drawing adolescents to AFHCs at health posts amidst other clients for reproductive health services was feasible Community sensitisation with</p> <p>1565 adolescents used services during 3 years research compared to 3250 over subsequent 3 year scale up phase Attendance of boys at centers was lower than girls (specific numbers not indicated) Proportions of health problems for which</p>	<p>Increased knowledge of boys and girls on SRH issues (proportions or significance testing not specified) Increased contraceptive acceptance to 86% Increased awareness of ARHCs and range of services among boys</p>	<p>No baseline given, increased awareness of services). No comparison group.</p>

Table 6 Main findings of research studies (N=12) (Continued)

	<p>involvement of gatekeepers was feasible and important Peer volunteer approach not successful, but rather clients were referred to center by health care providers IEC activities through local television network and pamphlets were not effective</p>	<p>boys and girls sought services were compared between research and scale-up phases (No significance testing specified): Boys: Seeking contraceptives: 17.4% during research vs. 4.3% during scale-up, information and counselling on growing up/sexual concerns 62% vs 67.5% Girls: seeking contraceptives 21.8% vs. 11.6, information/ counselling on growing up/sexual concerns 15.4% vs. 79.3%, menstrual concerns 20.8 vs. 9.5%</p>	<p>and girls from 0% to 77% (no significance testing specified)</p>
8			<p>Projection exercise shows substantial reduction of future population size with possible PRACHAR interventions in Bihar and Uttar Pradesh (including immediate slow growth of newborns, socioeconomically disadvantaged sections of population most benefit from communication interventions)</p>
9			<p><u>Main quantitative findings:</u> (1) Contraceptive use highest among couples in which both spouses were exposed to PRACHAR communications (2) Intervention wives more likely to participate in contraceptive decision than comparison. Those with lower parity were more involved in decision-making (3) Intervention participants less willing to marry before legal age, more likely to talk with parents about desired marriage age (4) Intervention participants married 2.6 years later, had first birth 1.5 years later than non-participants. More participants used contraceptives to delay</p>

Table 6 Main findings of research studies (N=12) (Continued)

		<p>1st birth and space 2nd birth than non-participants</p> <p><u>Main qualitative findings:</u> Situation in Bihar is improving in terms of education, delayed marriage, small families; patriarchal norms still deeply rooted, PRACHAR played role in changing community perceptions on girls' education, age, at marriage, SRH</p>
10	<p>Significant improvements observed between pre-test and mid-point and pre-test and follow-up scores; not between mid-point and follow-up scores</p> <p>Satisfactory improvement in all 8 AWWs re: use of anemia self-assessment chart for screening of anemia, E-chart for vision, weighting scale and measure tape for BMI and record book keeping</p> <p>Communication skills (better history taking re: menstruation, diet and effective health education also improved in all 8 AWWs)</p> <p>Before study, no enrolment of adolescent girls in Anganwadis before study, no health check-up carried out by AWWs, no girls being given IFA tablets, no IEC activities related to AFHS found at Anganwadi centers</p>	<p><u>Baseline data of adolescent girls:</u> Mean KAP score was 28.56 out of 48 total-knowledge related the contraception, masturbation, reason of adolescent changes, and reason of initial irregular menstruation after menarche was unsatisfactory</p> <p>Health seeking behaviour was poor (21% unaware that they are beneficiaries of Anganwadi and 11% unaware about facilities for their healthcare)</p> <p>Majority (82%) of adolescent girls were undernourished</p>
11		<p>Odds of contraceptive use were 5x higher in intervention group than comparison group for females; for males 3.6x higher.</p>
	<p>Median age was 2.6 years higher in intervention females, 2.8 years higher in intervention males than comparison group.</p> <p>Relative Risk of marriage by time of survey (after adjusting for schooling and caste differences) was 44% lower for females and 26% lower for</p>	

Table 6 Main findings of research studies (N=12) (Continued)

12	Majority of clients were satisfied with services they received from facility (Arajiline 82% vs. Hosakote 65%), relative change of utilization of services was significantly higher in Arajiline than Hosakote	More adolescents were aware of services in Hosakote (56-75%) vs. Arajiline (67% to 97%)	males in intervention than comparison Age at first birth also lower in intervention than control group (after adjusting for marriage, education, caste)
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- Key
- AFC Adolescent Friendly Centre
 - AFHC: Adolescent Friendly Health Centre
 - AFHS/YFHS Adolescent/Youth Friendly Health Service
 - ARSH Adolescent Sexual and Reproductive Health
 - ASHA Accredited Social Health Activist
 - ANM Auxiliary Nurse Midwife
 - AWW Aangan Wadi Worker
 - BMI Body Mass Index
 - CHC Community Health Center
 - IFA Iron Folic Acid
 - MO Medical Officers
 - NGO Non Government Organization
 - KAP Knowledge, Attitudes and Practices
 - PHC: Primary Health Centre
 - RH Reproductive Health
 - RSH Reproductive and Sexual Health
 - SC Sub Centre
 - SDH Sub-District Hospital
 - SRH Sexual and Reproductive Health
 - SRHS Sexual and Reproductive Health Services

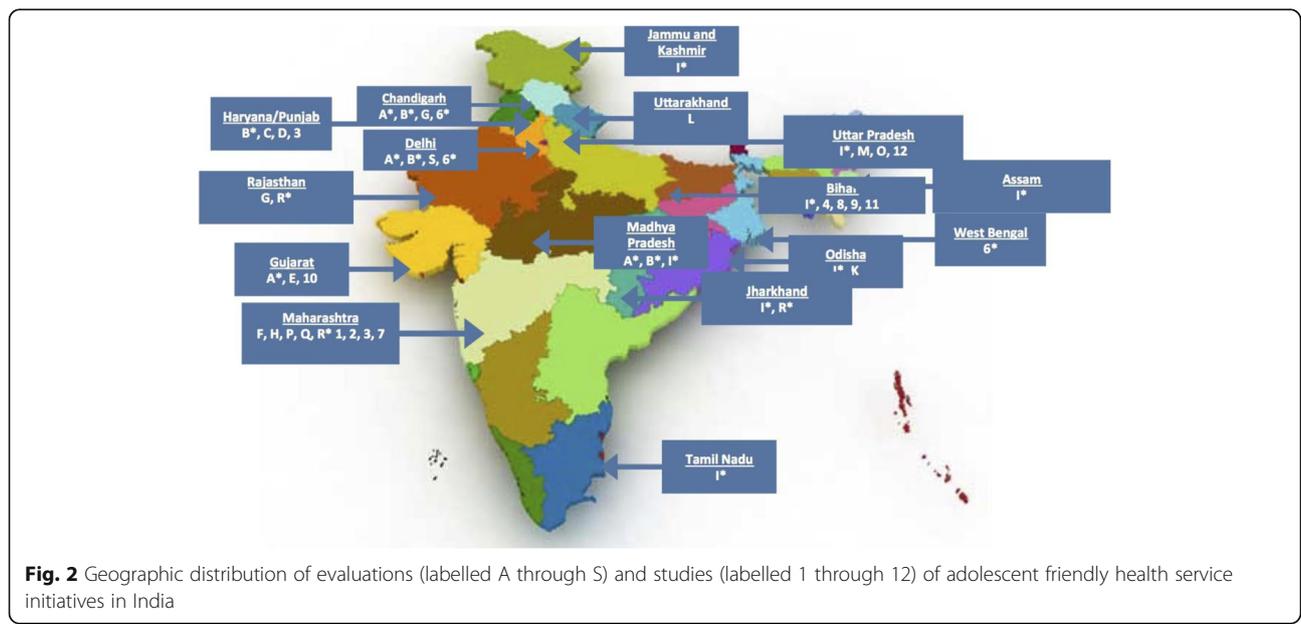


Fig. 2 Geographic distribution of evaluations (labelled A through S) and studies (labelled 1 through 12) of adolescent friendly health service initiatives in India

situation analysis, and those using combinations of designs. A descriptive design was used in most evaluations/studies (*E,F,G,H,I,K,M,O,P,R,S*; 2,4,12), quasi-experimental in 10 (*A,B,C,D,J,L*; 5,6,8,11), a feasibility assessment in one (*Q*) and combinations of designs in five (*I,3,7,9,10*).

The most commonly utilized methodology was a simple post-implementation, cross-sectional analysis without a comparison group, found in 18 evaluations/studies (*E,F,G,H,I,K,M,O,P,R*; 1,2,3,4,9,10,11). In contrast, eight (*B,J,L*; 1,3,5,7,10) applied a pre- and post-implementation (i.e. baseline and follow-up) analysis without comparison groups. We also observed the comparison of “exposed” (facilities/participants who received an AFHS intervention) versus those who were “non-exposed” (facilities/participants who had not received an AFHS intervention); this was used in five evaluations/studies (*A,D*; 3,6,11).

In addition to quantitative analytic methods, many evaluations/studies utilized qualitative methods by means of key informant interviews, in-depth client interviews, or focus group discussions to assess various aspects of an AFHS initiative. Qualitative methods were used in 15 evaluations/studies (*E,F,G,M,O,P,R,S*; 1,2,3,6,7,9,12). Details specific to the qualitative analytic techniques were rarely described.

Facility checklists were utilized in a number of evaluations/studies (*C,E,F,G,I,K,L,M,P,S*), and facility attendance records were analysed in five (2,4,6,7,12). Provider interviews or questionnaires were used in nine (*E,F,G,K,P,R,S*; 6,10) while adolescent client interviews or questionnaires were used in 12 reports (*A,B,C,E,G,M,O,P,R,S*; 6,12). One (*R*) employed mystery clients. Standard definitions of quality varied widely and were inconsistently described in the reports. Only four reports (*C,E,Q,P*) specifically reported on the seven standards of quality noted in (Table 1) using the quality criteria set out in the Ministry’s implementation guide. (Reference 1), while others (*H,K,P,S*) describes quality measures that were similar to these standards but not explicitly standardized.

What was the nature and extent of facilities and service users included in the evaluations/studies?

Where descriptions were provided, there was variability in the nature and extent of health facilities and adolescent users included. Many reports did not contain this information. When information was available, as we found in thirteen evaluations/studies (*C,D,E,F,G,I,K,L,M,P,Q,R,S*), the size and distribution of target adolescent populations receiving an AFHS intervention was rarely stated. An exception was *D*, which reports that each cluster of three villages has an estimated adolescent population of 3000–5000, of those approximately 600 adolescents were sampled in each village. Thus, it was

often challenging to assess representative nature of a sample or generalizability of the report.

Many reports noted number and kind of health facilities included in the context of a facility assessment (for example, one evaluation in Gujarat (*E*) included twenty-one facilities, representing 50% of all ARSH facilities in the intervention community and one in Rajasthan (*G*) covered 12/110 operating adolescent friendly health clinics (11%), including one of each facility type (district hospital, community health centre, and primary health centre) from each of the four selected districts. From these, evaluators sampled adolescent clients and service providers and also observed facilities using a checklist. Some reports described the number of health service providers or stakeholder interviews, for example, report *E* describes that three state officials, nine district officials, seventeen medical officers, and nineteen grassroots level health workers were interviewed.

We could not infer the representativeness of users surveyed from the information provided. While all evaluations/studies that included surveys or interviews with adolescent clients indicated number of adolescents interviewed, typically stratified by age, rarely did reports describe the sampling population from which these survey participants were drawn or how representative of the sample population they were. Where qualitative methodology was adopted, multiple reports described the number of focus group discussions conducted without indicating the number of participants included in each focus group (*E,M*; 9).

What were the main findings of the evaluations/studies?

Process

Very few reports commented on process outcomes, specifically programme design or fidelity of programme implementation, and whether any mid-course adaptations were made. The exceptions were report *Q*, which included specific comments about process of programme design, and a few which examined feasibility of programmes (*B,Q*; 1) or commented on challenges of implementation or monitoring (*E,C,F,G,L*). Quality was assessed variably across evaluations/studies, with the minority that used the adapted Ministry standards demonstrating an increase across all quality standards compared to control groups or previous time intervals. Persistent unmet quality standards were noted: lack of ensuring adequate equipment and supplies (*P*), inadequate awareness in the community about services (*C,E,Q*) and inadequate management systems in place (*C,F*).

Outputs

More evaluations/studies described outputs, with 11 evaluations (*D,E,G,H,M*; 1,2,3,4,7,12) including assessments of

service utilization. All but one report (G) reported that utilization increased as a result of an AFHS initiative. However, not all results were presented with baseline data.

Health knowledge and behaviour outcomes

In general, programmes designed to make health services more adolescent friendly resulted in increased knowledge about RSH needs of adolescents, both among service users themselves (A,B,D,L,R,S; 1,3,5,7,10,12) and among health service providers (K,10). Furthermore, a number of evaluations/studies commented on acceptance of the programme by gatekeepers in the community, such as parents (B,C;1,3). The most common behaviour outcomes evaluated were self-reported sexual health behaviours, such as condom or contraceptive use (A,J,L;5,9,11). In these studies/evaluations, AFHS exposure was associated with increased reported contraceptive and sanitary pad use.

Programme results/impact

A small number of initiatives evaluated programme results/impacts such as levels of delayed first birth [9, 11] or anaemia (B,2), and an early study (A) of CEDPA Better Life Options Programme examined mean number of children and rates of child deaths-finding both to be decreased. The PRACHAR intervention (11) demonstrated greater age at marriage and first birth at the community level.

Using the SQUIRE-adapted scoring system consisting of fifteen questions, the mean quality score averaged between two independent scorers was 8.1/15 (54%). Interrater reliability for scores in independent domains was variable ($\kappa = 0.122$, $p = 0.014$), however the average mean quality score was not significantly different (8.53 vs. 7.63, $p = 0.291$).

Discussion

This is the first study to systematically review a body of country-specific evaluations and studies of AFHS initiatives and to draw conclusions about their quality and their effects. We found that at least 30 independent evaluations and studies have been conducted over a wide geographic distribution of India since 2000. They have been carried out primarily by NGOs and academic institutions and have focused on government-sponsored AFHS programmes or independent NGO initiatives to strengthen government services. They focused primarily on service utilization trends and health behavioural outcomes and less frequently on design and implementation of AFHS. The rationale for sampling strategies was not uniformly described in evaluation reports making it challenging to assess the generalizability of the findings. Further, study designs most commonly used were

descriptive or quasi-experimental in nature, and frequently lacked a comparison group to draw inferences on effectiveness of initiatives. Future evaluations and studies should be better designed and implemented and should pay more attention to process and long term impact.

Most evaluations/studies demonstrated improvement in the quality of services as a result of government or NGO initiatives to make services more adolescent-friendly. Many also showed an improvement in adolescent knowledge levels of RSH issues, and in health behaviours, such as use of contraception, while few demonstrated positive programme results/impacts.

While much national and international attention has been paid to improving the quality of health systems for adolescents, few efforts to do so have been rigorously studied [14]. It is evident from these evaluation and study reports that a standard approach to evaluation of AFHS has not been adopted. The WHO has developed and promoted the application of its Quality Assessment Guidebook [15] which could facilitate greater comparability across evaluations/studies, but using it will require support—one evaluation (F) specifically referenced using WHO quality assessment tools, describing them as “very elaborate and time consuming” and needing to be simplified for local use.

The publication dates reveal that the volume of evaluations and studies of AFHS has increased over time, which is likely attributable to the establishment of the National Health Mission policy and accompanying resources made available for AFHS both by the Government of India and others. Some geographic regions like Maharashtra and Bihar are more represented than others, which may reflect differences in state government support of evaluation resources or external agency interest.

Reviews and syntheses of AFHS in low- and middle-income countries (LMICs) have been conducted at the global level. An example of the former is a review of research and evaluation evidence in improving the quality and use of SRH services by adolescents in LMICs. It found the most robust evidence for programmes using a combination of approaches including health worker training and facility improvements as well as strategies for demand generation and community acceptance [15]. An example of the latter is synthesis of programmatic outputs (i.e. quality and coverage) and service utilization in eight LMIC countries, which concluded that with support, government-run health facilities can improve the quality of health services and their utilization by adolescents [16].

Moving to measures and methods, a systematic review of indicators of youth-friendly health care in high-, middle-, and low-income countries, identified 22 studies, 15

of which used quantitative methods, six used qualitative methods, and one used mixed methodology [17]. The review further expanded upon eight domains as central to young people's positive experience of care, including accessibility of health care, staff attitude, communication, medical competency, guideline-driven care, age appropriate environments, youth involvement in health care, and health outcomes. Certain attributes, particularly staff attitudes that were respectful and friendly, were universally applicable while some domains such as clean environment were more dependent to context. While understanding the most appropriate quality indicators is paramount to valuable evaluation, there is little research examining strengths and weakness of different evaluation designs. A recently published post hoc evaluation of a multi-country study on adolescent health provides pointers on good practice in designing and executing studies and evaluations [16]. More attention is needed on the strengths and weakness of different study and evaluation designs on AFHS.

Limitations

The variety of ways in which evaluations and studies are published and disseminated, ranging from peer-reviewed journals to NGO reports may have limited our ability to access all existing reports. We included only publicly available reports and peer-reviewed journal articles, which may have further limited our access to evaluation reports that have not yet been placed in public domain or may be currently in progress. Further, a publication bias for positive results may have influenced the findings of our review, although our search included reports published outside of the peer-review process. Because the evaluations ranged from brief reports to full evaluation summaries, it is possible that only select findings have been made publicly available but more thorough evaluation data exists. Furthermore, only few publications provided copies of uniquely developed assessment tools for application in other settings. This presents challenges in comparing evaluation findings across states and also suggests the potential benefit of disseminating validated tools for shared use.

Conclusions

Evaluations and studies of AFHS initiatives in India are being performed and disseminated. The strengths of these evaluations include clearly stated objectives, frequent use of multiple data sources, and assessment of programmatic outputs as well as health outcomes and impacts. We observed significant variability across study designs in these evaluations, and the target populations and comparison groups were inconsistently defined. Our findings demonstrate that AFHS initiatives have demonstrated improvements in healthcare quality and

utilization by adolescents, increased SRH knowledge, and in some settings, improved sexual health behaviours such as condom and contraception use.

India's new Adolescent Health Programme – *Rashtriya Kishor Swasthya Karyakram* aims to broaden strategies for community-based health promotion and to strengthen preventive, diagnostic, and curative services for adolescents across levels of health facilities [17]. This programme highlights the importance of strong monitoring and evaluation systems, thus it is vital to build upon current knowledge of best evaluation practices in order to ensure the greatest impact to adolescent populations in India and worldwide.

Appendix 1

Medline search strategy

We chose to begin our search in 2000 because the International Conference on Population and Development +5 review (1999) reiterated the importance of enabling adolescents to obtain the health services they need and renewed attention and support for action in this area [18].

Searched 21/7/14: PubMed 152 Results

((("adolescent health services"[major] OR "adolescent health services"[tw] OR ("adolescent-friendly"[tiab] OR "adolescent friendly"[tiab] OR "youth friendly"[tiab] OR "youth-friendly"[tiab]) AND ("healthcare services"[tiab] OR "health care"[tiab] OR "health services"[tiab] OR health services[mesh] OR preventive health services[-mesh] OR "preventive health services"[tw])) OR school health services[mesh] OR "school health services"[tw]) OR ("reproductive health services"[major] OR "reproductive health services"[tiab] OR "sexual health services"[tiab] OR "reproductive and sexual health services"[tiab] OR "sexual and reproductive health services"[tiab] OR "sexual reproductive health services"[tiab] OR "reproductive sexual health services"[tiab])) AND ("India"[mesh] OR "India"[tiab] OR "India"[ot]) AND ("young adult"[mesh] OR "adolescent"[mesh] OR "minors"[mesh] OR adolescent*[tiab] OR teen*[tiab] OR juvenile[tiab] OR preteen*[-tiab] OR pre-teen*[tiab] OR youth[tiab]) AND ("2000/01/01"[PDAT] : "3000/12/31"[PDAT]) AND ("adolescent"[MeSH Terms] OR "young adult"[MeSH Terms]) AND English[lang])

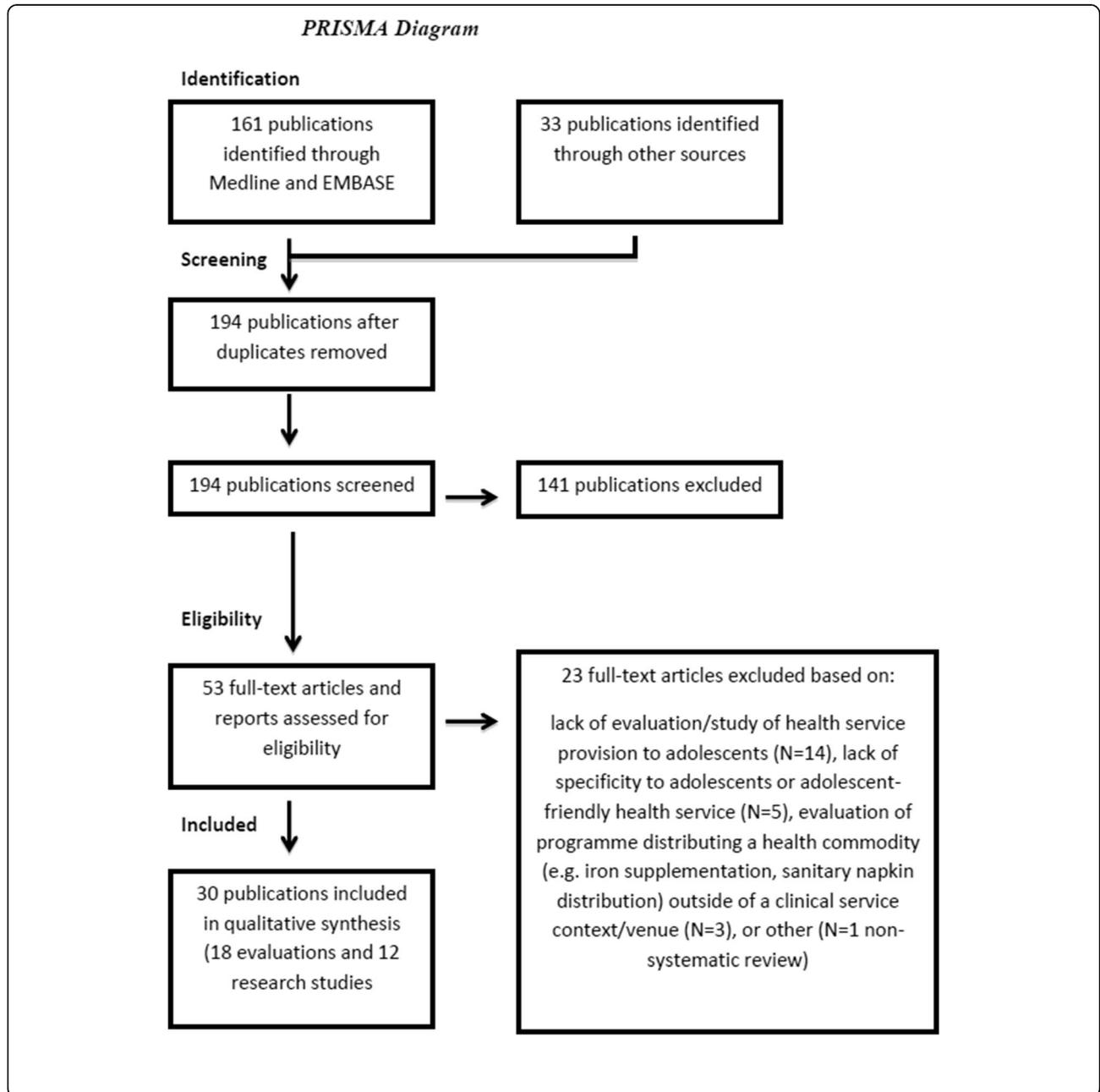
Appendix 2

EMBASE search strategy

21/7/14: EMBASE 9 results

'adolescent friendly' OR 'youth friendly' AND ('health service'/exp OR 'health service' OR 'reproductive health'/exp OR 'reproductive health' OR 'evaluation'/exp OR 'evaluation') AND ('india'/exp OR 'india') AND [2000-2014]/py AND [embase]/lim NOT [medline]/lim

Appendix 3



Appendix 4

Peer-reviewed publications that were reviewed in full-text and excluded

Table 7 Peer-reviewed publications that were reviewed in full-text and excluded

Author, date	Description	Reason for exclusion
Andrew et al, 2003 [19]	Mixed methods study of needs and preferences of adolescents	No evaluation of health services
Biswas et al, 2002 [20]	Pre- and post- evaluation of RCH workshops for providers and program managers	Not specific to ARSH or AFHS
Calhoun et al, 2013 [21]	Mixed methods study of provider imposed restrictions to clients' access to family planning in urban Uttar Pradesh.	No mention of adolescent-specific services
Char et al, 2011 [22]	Descriptive study of young men's knowledge and attitudes regarding family planning methods and sources of info.	No evaluation of health services
Char et al, 2010 [23]	Qualitative study of influence of mothers-in-law on young couples' family planning decisions.	No evaluation of health services
Collumbien et al, 2011 [24]	Descriptive study service utilization among young people prior to two large interventions	No evaluation of health services
Das et al, 2006 [25]	Descriptive study of disease burden and treatment seeking behaviour among adolescent girls	No evaluation of health services
de Souza, 2014 [26]	Descriptive study of roles performed by peer HIV workers	Program not specific to adolescents
Dongre et al, 2011 [27]	Evaluation of a school-based health program involving formation of school health committee and committee activities including deworming and IFA supplementation	Health commodity distribution without clinical health services
Hazarika et al, 2009 [28]	Descriptive study of adolescent utilization of contraceptive and ANC services as well as in-facility delivery	No evaluation of health services
Kotecha et al, 2009 [29]	Evaluation of a school-based health program involving IFA supplementation and health education	Health commodity distribution without clinical health services
Mishra et al, 2012 [30]	Descriptive study of treatment-seeking behaviour of adolescent girls	No evaluation of health services
Nair et al, 2012 [31]	Descriptive study of adolescent knowledge, attitude and practice related to reproductive and sexual health	No evaluation of health services
Nair et al, 2012 [32]	Comparative study of adolescent boys vs. girls' knowledge, attitude and practice related to reproductive and sexual health	No evaluation of health services
Nair et al, 2012 [33]	Comparative study of married male vs. female young adults knowledge, attitude and practice related to reproductive and sexual health	No evaluation of health services
Nair et al, 2012 [34]	Descriptive study of perceptions of community stakeholders	No evaluation of health services
Nath et al, 2008 [35]	Non-systematic review of AFHS	Does not include specific evaluations and their methodologies
Rao et al, 2008 [36]	Evaluation of a school-based reproductive health education program among adolescent girls	No evaluation of health services
Sabarwal et al, 2012 [37]	Descriptive study of treatment seeking behaviour for reproductive tract infections among young women	No evaluation of health services
Shah et al, 2013 [38]	Evaluation of sanitary pad distribution program	Health commodity distribution without clinical health services
Sharma et al, 2012 [39]	Evaluation of male reproductive health program	Program not specific to adolescents
Singh et al, 2012 [40]	Descriptive study of health care utilization among married adolescent women	No evaluation of health services, not specific to AFHS
Speizer et al, 2012 [41]	Descriptive study of family planning service utilization trends in Uttar Pradesh	No specific data for adolescent or evaluation of AFHS

Abbreviations

AFHS: Adolescent friendly health services; CEDPA: The center for development and population activities; CORT: Centre for operational research and training; MeSH: Medical subject heading; NGO: Non-governmental organizations; RSH: Reproductive and sexual health; WHO: World health organization

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Availability of data and material

Please contact corresponding author for data requests beyond what is available in tables and appendix.

Authors' contributions

AH conducted data collection, carried out analysis, drafted the initial manuscript, and approved the final manuscript as submitted. PA conducted data collection, carried out the analysis, reviewed and revised the manuscript, and approved the final manuscript as submitted. SB provided input on study methodology, reviewed and revised the manuscript, and approved the final manuscript as submitted. VCM conceptualized and designed the study, supervised the analysis, reviewed and revised the manuscript, and approved the final manuscript as submitted.

Authors' information

No additional information.

Competing interests

All authors declare that they have: received no support from any organisation for the submitted work; no financial relationships with any organisations that might have an interest in the submitted work in the previous 3 years; no other relationships or activities that could appear to have influenced the submitted work.

Consent for publication

All authors have approved this final version of the manuscript.

Ethics approval and consent to participate

Not applicable as manuscript does not report on or involve use of any individual animal or human data or tissue.

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