



Review Article

A systematic rapid review on quality of care among non-communicable diseases (NCDs) service delivery in South Asia

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ABSTRACT

Background: At present, poor quality of care (QoC) surrounding non-communicable diseases (NCDs) service provision poses a threat to South Asia. This systematic rapid review aims to highlight the available approaches to improve QoC in NCD services in South Asian countries.

Methods: Three electronic databases (Medline, Embase, and the Cochrane Library) were used to identify relevant literature. Studies published from January 1, 1990 to December 31, 2020 were included. Studies published in English in the South Asian context following any research design about four major NCDs (cancer, diabetes, cardiovascular disease, chronic respiratory disease), and interventions to achieve QoC were included. Data extraction was done using a pre-specified form. A narrative synthesis was conducted for analyzing the extracted information. This systematic rapid review is registered in PROSPERO (International prospective register of systematic reviews) - CRD42020157401.

Results: Among 829 identified studies, 13 were included in the review for in-depth analysis. Most of the studies focused on cancer followed by diabetes and cardiovascular disease. Community and clinic-based screening, NCD care education, NCD specialized corner or hospital, and a follow-up system ensure patient satisfaction, accessibility, early detection, timely referral, and help to reduce disease severity, mortality rate, and incidence of the new disease.

Conclusions: Effective interventions for improving QoC surrounding NCD services can be scaled up in different settings in South Asia to reduce the burden of NCDs.

1. Background

Worldwide, non-communicable diseases (NCDs) have become the leading cause of premature deaths due to the global epidemiological transition. In 2016, 56.9 million deaths occurred worldwide, of which 71% (40.5 million) were due to NCDs. In low and middle-income countries (LMICs), premature deaths due to NCDs accounted for 46% of 31.5 million deaths [1].

Expectedly, South Asia is facing an epidemiological transition from communicable diseases to NCDs. The percentage of NCD-related deaths out of the total number of deaths in South Asian countries ranges from 44% to 84%. NCD-related premature death statistics in these countries share a similar trajectory [2].

People in South Asia are suffering from all four major types of NCDs. According to recent cancer statistics, 1 million out of 1.3 billion people were diagnosed with cancer annually in India, and 600,000 to 700,000

deaths were attributed due to the disease in 2012. The International Agency for Research on Cancer (GLOBOCAN) has predicted that this number will double in South Asia in the next 20 years [3]. South Asians face a quadrupled risk of developing diabetes, compared to other ethnic groups, and their transitioning lifestyle makes it worse [4,5]. It is estimated that, by 2030, the total number of people affected by diabetes in India, Pakistan, and Bangladesh will reach 46, 14, and 11.1 million respectively [6]. Out of 17 million NCD-related premature deaths that occurred throughout the world in 2015, approximately 37% occurred in LMICs due to cardiovascular diseases (CVD) [7]. In 2017, data published by the World Health Organisation (WHO) revealed that CVD accounted for a considerable amount of total deaths in South Asia [8]. Worldwide, chronic respiratory disease is the third leading cause of death [9], and in LMICs, more than 90% of deaths occur due to Chronic obstructive pulmonary disease (COPD) [10]. Chronic respiratory diseases accounted for 3–11% of total NCD-related deaths in South Asia [2]. Due to the massive

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burden of NCDs in South Asia, the global development community is committed to a global target of reducing premature mortality from NCDs by one-third before 2030 [11].

The South Asian Region is densely populated, and half of the total population lives below the poverty line [12]. It was estimated that about 8.6 million deaths were occurring in LMICs, due to the lack of appropriate quality care [13]. As a result, it is crucial to maintain the quality of care (QoC) in NCD services in South Asia. In this review the concept of QoC was adapted from WHO as “health care must be safe, effective, timely, efficient, equitable and people-centered” for achieving QoC in health care services [14].

There are limited studies where QoC around NCD services were discussed concurrently. A systematic review reported that there was difficulty in identifying scientific articles on major NCDs and approach to ensure QoC [15]. Other reviews described interventions to manage NCDs [16] and service availability around NCDs but the QoC issue was absent [17].

No systematic review focusing on ensuring QoC for NCD services in South Asia was identified. As a result, this systematic rapid review is essential because of the high NCD burden, and little attention to QoC surrounding NCD services. Thus, this systematic rapid review aims to investigate available interventions to identify QoC around NCD services, and the impact of these interventions to reduce the NCD burden in South Asian countries.

2. Methods

A systematic rapid review was conducted which followed the recommended rapid review guideline by WHO [18] and preferred reporting items for systematic review and meta-analysis (PRISMA) guidelines. This systematic rapid review is registered in PROSPERO (International prospective register of systematic reviews) - CRD42020157401.

Study population: NCD services for all people living in the South Asian region were considered.

Intervention: Studies that discussed the interventions implemented by both public and private ventures related to QoC dimensions such as people-centeredness, accessibility, continuity of care, safety, acceptability, equity, effectiveness, efficiency [14] in the health system were included in this systematic rapid review.

Comparison and type of studies: No comparison group was required in studies included in this systematic rapid review.

Outcome: Reduction of mortality, morbidity, the incidence of a disease and health inequalities, increasing life expectancy, patient satisfaction, accessibility and acceptability of health services, shortening patient’s waiting time, improving outcomes for disease, and efficiency of NCD health services were the outcomes that were considered.

Study selection, timeline, and language: This systematic rapid review was not limited to any study design and considered studies published in English only. However, review articles, letters, correspondence, etc. were excluded. The timeline of this systematic rapid review ranged from January 1, 1990 to December 31, 2020 as there has been a steady increase in NCDs in South Asian countries since 1990 [12].

Search strategy: The comprehensive search strategy was applied to retrieve articles from three databases (Medline, EMBASE, Cochrane database). It was recommended by the WHO to utilize these three databases as they include 95% of the literature [18]. Key search terms were “Non-communicable diseases”, “South Asia”, “quality of care”, “accessibility, effectiveness, efficiency, acceptability, and “continuity of care”.

Screening: Studies found from the primary search were exported to Endnote and two-step screening (title – abstract and full text) was done according to the inclusion and exclusion criteria. Citation tracking from the systematic review was done to include more studies in the review. A second reviewer checked and validated the screening process.

Data extraction: Data were extracted by using a detailed data extraction matrix where basic study information, intervention/approach

taken, information on sample sizes, outcome variables, intervention details, relevant statistics, and information on outcomes, etc. were included. This matrix was piloted with two (10%) studies to check the consistency.

Bias assessment: Cochrane risk of bias (ROB) tool was used for assessing Randomized Controlled Trials (RCTs) and the Joanna Briggs Institute (JBI) Critical Appraisal tool was used to assess the quality of other studies. For the overall grading of observational studies, 0–3 “yes” answers were marked as poor quality, 4–6 “yes” answers were considered as moderate quality, and more than six “yes” answers were ranked as a good quality study. Quality assessment was also validated by a second reviewer.

Data synthesis: A data-driven, in-depth analysis was conducted through narrative synthesis, as there was considerable heterogeneity among the studies such as study design, methodology, intervention packages, outcome variables, results, and quality of study [18]. A narrative synthesis was performed to arrange and compare relatively homogenous studies together according to their similarities and dissimilarities [19,20]. Meta-analysis was not conducted due to the absence of homogeneity among studies.

Patient and public involvement: This is a systematic rapid review and no patients are directly involved in the process.

3. Results

Study selection process: Initially, 829 studies were identified from three databases, out of which 13 studies were considered for final analysis.

Fig. 1 describes how studies were found and included by applying the inclusion and exclusion criteria.

Study setting and study characteristics: Majority (n = 7) of included studies were from India followed by Pakistan (n = 2), both India and Pakistan (n = 1), Bangladesh (n = 1), Nepal (n = 1), and Sri Lanka (n = 1). No studies were found from Afghanistan, Bhutan, or the Maldives. Most of the (n = 10) interventions took place at the hospital or clinic level [21–30] whereas some (n = 3) were based on the community setting [31–33].

Majority of the included studies (n = 8) were cross-sectional [22,23, 25,26,28,29,31,33] followed by RCTs (n = 3) [21,30,32], non-randomized before-after intervention study (n = 1) [27], and qualitative study (n = 1) [24] (Table 1).

Quality assessment: Among the RCTs, allocation concealment was found “unclear” for two studies [30,32]. Random sequence generation, performance bias, detection bias, and attrition bias was found as low risk of bias for two studies. All RCTs reported a low risk of reporting bias [21, 30,32]. The absence of allocation concealment and attrition rate resulted in the unclear risk of bias for one study [32]. The remaining RCT did not mention any of the bias except the primary outcome and attrition rate [30]. The risk of bias of RCTs has been demonstrated in Fig. 2.

In overall grading, among eight cross-sectional studies, four studies [22,23,26,31] were of good quality, three [25,28,33] were of moderate quality and one study [29] was found to have poor quality. As per the adapted grading system, the qualitative study [24], and non-randomized intervention study [27] were graded as good quality studies. Studies assessed as good quality had adequate information on study setting, sample size, sampling method, statistical analysis, reporting system, ethical consideration, and confounding.

Intervention and outcome

Intervention related to cancer and its outcome: 9 out of 13 studies that were included in this review focused on interventions to improve QoC in cancer services. Here, two studies discussed community-based [31,32], and one study discussed clinic-based screening services [22] to improve QoC for cancer patients.

Community-based intervention for cancer screening: A community-

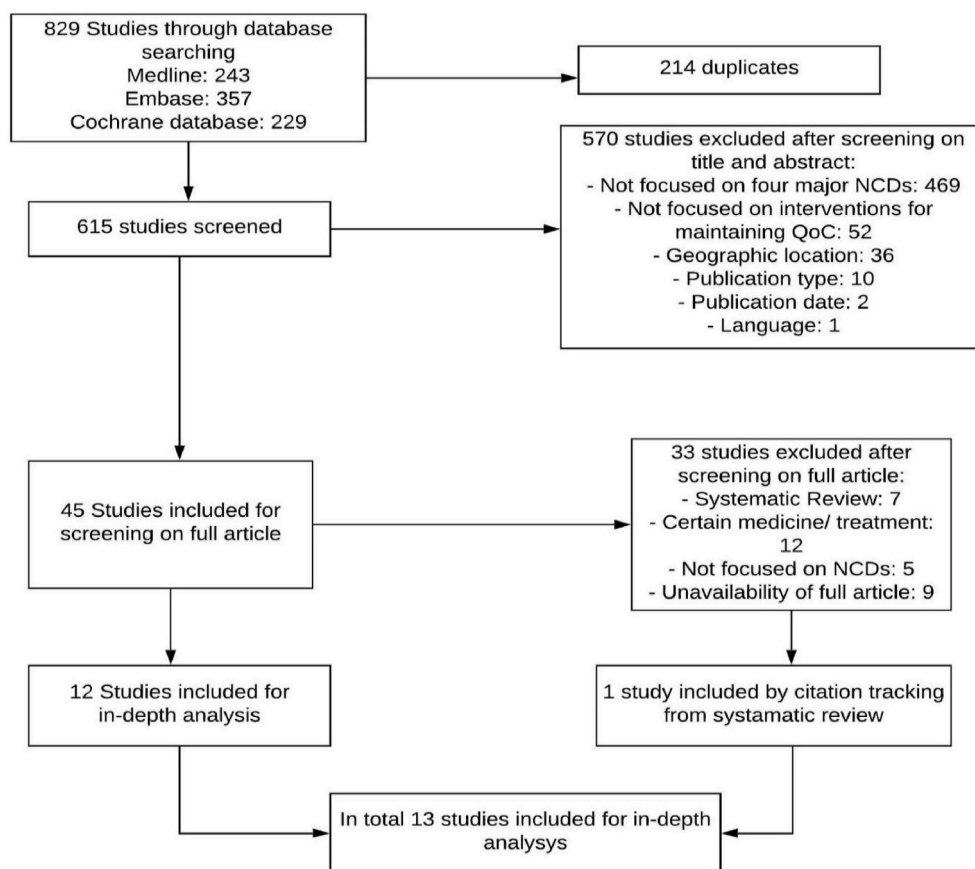


Fig. 1. Flow chart of the study selection process.

based cervical cancer screening program by trained health workers (HW) was discussed in one study where Visual Inspection with Acetic Acid (VIA) test, colposcopy, punch biopsy, treatment, and advice were provided consecutively which increased the availability of service provision to village women and treatment compliance and reduced the incidence and severity of advanced cervical cancer. The services were satisfactory to 64.7% of women and very satisfactory to 5.6% of them. Women with positive results on the VIA test were immediately scheduled for colposcopy and women with abnormal colposcopy were referred for cervical punch biopsies which result in 100% and 95.6% compliance to treatment in both cases [31].

A 15 year-long RCT on community-based oral cancer screening program was run by trained HW where awareness rising through home visits, screening services, further treatment for positively screened patients, referrals, etc. were provided to the community people to increase treatment facilities and awareness [32]. This intervention significantly reduced the mortality rate of oral cancer among tobacco/alcohol users and non-users. Through community-based care and health education, the incidence of advanced oral cancer among tobacco/alcohol users reduced significantly (RR 0.79, 95% CI: 0.65–0.95) [32].

Clinic-based intervention for breast cancer screening: A clinic-based screening and early detection program was conducted in Gampaha district, Sri Lanka, where clinical breast examination (CBE) and breast self-examination (BSE) were done by public health midwives/HW for early detection of breast cancer. Women were found satisfied with clinic space (83%), privacy (86%) and time spent (97%) during CBE, toilet cleanliness (58.5%), availability, and comfort of sitting facilities in the waiting area (85.5% and 84.5%). A clinic-based breast cancer detection program has helped to increase breast cancer detection and service coverage from 1.1% –2.2% between 2003 and 2007. Referral service increase and 86.8% of women who were detected with breast

abnormalities were referred for further care [22].

Telephone-based follow-up for cancer patients: In one study, telephonic follow-up besides physical follow-up was arranged for the patients with cancer who were already under planned treatment. An unchanged questionnaire was used to compare the patient's physical condition, satisfaction, cost, and time associated with both types of follow-up. A negative correlation was found between time spent in telephonic follow-up and patient satisfaction ($r = -0.147$, $P = 0.002$). Patients preferred a physical follow-up even though it required a higher financial investment. 70.27% of study participants acknowledged the anxiety reduction when they attended a physical follow-up [26].

Structured supportive care for psychological wellbeing: Due to a structured five weeklong hospital-based physical and psychological supportive care for women undergoing chemotherapy for six weeks, patient's ability to control their mood (82.4%), acceptance of the disease and its treatment (94.1%), positive outlook toward life (76.5% women's interest toward life grows and 70.6% of women to practice positive coping strategies in their daily life), etc. increased. This intervention was packed with group therapy where physical and psychosocial counselling and mind diversion activities for improving psychological and emotional wellbeing were provided [28].

Intervention to improve communication skills: A study explored that improved communication skills of service providers can increase patient's satisfaction around their behaviour. Three stage-intervention of this study included investigation of the patient's perception of doctor-patient communication, dissemination of results with service providers, and development of a communication strategy for service providers and provision of training for them [27].

One study discussed how a specialized hospital and palliative care centre for cancer could serve patients in a more engaging way [25]. Services from a specialized cancer hospital had increased patient

Table 1
Characteristics of included studies.

Study identifier	Study design	Geographic location, population, age, gender	NCD type	Intervention	Outcome/Result
Ali et al., 2016 [21]	Parallel, open-label, pragmatic RCT	- Diabetes clinics in India and Pakistan - 35+ years - Male & Female	Diabetes	Intervention: Regular physician's care, diabetes specific care coordinator's service through monthly phone call and follow-up visit once in three months. Control: Regular physician's care only.	- HbA1c level: Baseline: 9.9%, Intervention and control group difference: HbA1c level <7%: 12 month: 8.7% (P < 0.001) 30 month: 11.8% (P < 0.001) Intervention vs. Control: 21.5% vs. 11.1%, (RR, 1.93 [95% CI, 1.52 to 2.45]) - BP: Baseline: 143.3/81.7 mm Hg, Intervention and control group difference <130/80 mm Hg: 12 month: 1.7% (P = 0.56) 30 month: 9.2% (P = 0.002) Intervention vs. Control: 51.0% vs. 45.0%; (RR, 1.14 [CI, 1.04 to 1.26]) - LDLc level: Baseline: 3.17 mmol/L (122.4 mg/dL) Intervention and control group difference: LDLc level <100 mg/dL (<70 mg/dL for people with previous CVD): 12 month: 9.5% (P = 0.001) 30 month: 5.3% (P = 0.071) Intervention vs. Control: 56.4% vs. 47.1%; (RR, 1.23 [CI, 1.13 to 1.34]) Patients' satisfaction scores: Control group: Baseline: 44 3month: 50 12 month: 47.7 Test 1 group: Baseline: 45 3month: 66 12 month: 68 Test 2 group: Baseline: 43 3month: 68 12 month: 73
Upadhyay et al., 2015 [30]	Pre-post non-clinical randomised controlled trial	- Pokhara, Nepal - 16/+ years - Male and female both	Diabetes mellitus	Test 1 group: Educational materials (diabetes information booklet, diabetes complication chart, diabetic food chart, exercise, using insulin and glucometer) for increasing patients' diabetes awareness and management. Test 2 group: Educational materials and diabetic kit (includes glass tubing, chart of human anatomy with circulatory system, daily medication calendar and calendar of antidiabetic medicines) Control group: Usual service from nurse and doctor	Discussed about available diabetes care in different setting in Bangladesh. Control group: N/A
Lewis and Newell et al., 2014 [24]	Qualitative study	- Dhaka metropolitan City & Sylhet division, Bangladesh - Age group not mentioned - Male and female	Type 2 Diabetes	Discussed about available diabetes care in different setting in Bangladesh. Control group: N/A	- BIRDEM provides comprehensive education program (verbal and written) on diabetes care and patients have good awareness. - Only the BIRDEM clinic situated in capital offered regular comprehensive check-ups (full cardiovascular, renal and eyesight examinations). - Limited knowledge among patients who take service from specialist centres due to lack of getting proper diabetes guideline. - Rural Upazilla-level clinics contains limited resources to manage diabetes. - High service cost, resource limitation, long waiting line creates limitation to provide comprehensive treatment for service providers. - Poor diabetes management in rural and peri-urban area due to high service cost. - As basic diabetes services are unavailable in rural community clinic, so patients require extra money and time to travel to district hospital for service, which delayed care seeking for people.
Sing et al., 2014 [33]	Cross sectional study	- Chandigarh, India - Mean age 31.49 - Gender not mentioned	Cardiovascular disease	Intervening mobile phone and Bluetooth operated handheld tele-ECG machine in community level. Control group: N/A	- 100% accuracy of transmission rate of tele-ECG from handheld machine to mobile phone. - Tele-ECG result was transmitted to expert physicians based in

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Table 1 (continued)

Study identifier	Study design	Geographic location, population, age, gender	NCD type	Intervention	Outcome/Result
Basu et al., 2006 [31]	Cross sectional study	- Rural district of Bengal, a state in eastern India. - 30–65 years - Female	Cervical cancer	Community based cervical cancer screening test/via-test for women aged 30–65 years. Control group: N/A	Postgraduate Institute of Medical Education and Research (PGIMER) from remote area - Patients with acute myocardial infraction were screened through the tele-ECG machine and got immediate service from the specialized doctor. - Patients reported ~95% satisfaction about new tele-ECG machine as it ensured the availability of health care for people who lives in remote area. - Immediate colposcopy for women with positive via screening: 100% compliance - Cervical punch biopsies for women with abnormal colposcopy: 95.6% compliance, Biopsy was refused by 7 women. - Satisfied and very satisfied with the service: 64.7% & 5.6% accordingly - Accessibility and affordability mentioned by service recipient as it was community based and free screening.
Sankaranarayanan et al., 2012 [32]	Cluster randomized controlled trial	- Trivandrum district, Kerala, India. - 35/+ years - Male & Female	Oral Cancer	Intervention: Health worker provided screening facilities for oral cancer and health education to quit harmful practices + further direction on treatment from specialist for those who are screened positive. Control: Routine health care without screening facilities until 2006	- Cumulative advanced oral cancer mortality rate: RR 0.88, 95% CI (0.69–1.12) - Incidence of advanced oral cancers among tobacco/alcohol user or both: RR 0.79, 95% CI (0.65–0.95) - Advanced oral cancer mortality among tobacco/alcohol user or both: RR 0.76, 95% CI (0.60–0.97) - Oral cancer incidence in result of four repeated screening among all eligible people: mortality HR 0.76, 95% CI (0.49–1.17) - Oral cancer mortality rate in result of four repeated screening among all eligible people: Mortality HR 0.21, 95% CI (0.13–0.35) - Oral cancer incidence in result of four repeated screening among tobacco/alcohol user or both: mortality HR 0.62, 95% CI (0.41–0.92) - Oral cancer mortality rate in result of four repeated screening among tobacco/alcohol user or both: mortality HR 0.19, 95% CI (0.11–0.31).
Mahapatra et al., 2016 [25]	Cross-sectional study	- Odisha, India - 21–40 years - Male and female	Cancer	Oncology services provision in specialty hospitals in Odisha, India. Control group: N/A	- 13 out of 22 patients reported about good interpersonal behaviour of doctors. However, negative behaviour from supporting staff was reported. - Patient satisfaction on interpersonal manner 63% (3.2 ± 0.5). - Patient satisfaction in overall communication 70% (3.3 ± 0.5). - Few problems such as long waiting hours, shortage of bed for admission, long distance of specialized hospital etc. were reported.
Chiranthika et al., 2013 [22]	Cross-sectional study	- Gampaha, Western province of Sri Lanka - 35–39 years - Female	Breast cancer	Clinic based early detection service for breast cancer were provided. Then, assessment was done on coverage, quality and client satisfaction. Control group: N/A	Coverage: - Clinical Breast Examination coverage increased from 1.1% –2.2% between 2003 and 2007. - Proportion of breast abnormalities detected on 2007: 1.8%. - Proportion referred for further care detected with breast abnormalities: 86.8%. Quality:

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Table 1 (continued)

Study identifier	Study design	Geographic location, population, age, gender	NCD type	Intervention	Outcome/Result
Mathew et al., 2017 [26]	Cross sectional study	- Mumbai, India - 30–79 years - Male and female	Lung Cancer	Telephonic follow-up for cancer patients with planned treatment was introduced. Control group: N/A	<ul style="list-style-type: none"> - Clients satisfaction with the infrastructure: - Space in the clinic building: 83%, - Overall cleanliness of clinic: 82.5%, - Cleanliness of the toilets: 58.5%, - Availability of sitting facilities in the waiting area: 85.5%, - Comfort in the waiting area: 84.5% Satisfaction on service provision: <ul style="list-style-type: none"> - Politeness displayed by the health care workers: 98%, - Privacy while conducting CBE: 86%, - Time spent on CBE: 97%, - Health education on BSE: 98% Agreement between the telephonic and physical impression of disease: Substantial strength <ul style="list-style-type: none"> - Accuracy of telephonic versus physical follow-up: Among seven follow-up, five showed substantial strength (PABAK score: 0.67, CI: 0.51–0.79; 0.66, CI: 0.48–0.79; 0.68, CI: 0.44–0.84; 0.74, CI: 0.46–0.89, 0.68, CI: 0.32–0.88). - Satisfaction score: Telephonic follow-up: 8 Physical follow-up: 9 - Negative correlation between time spent in telephonic follow-up and patient satisfaction: ($r = -0.147$, $P = 0.002$). - Anxiety reduction after physical follow-up: 70.27% - Mean time spent for physical follow-up: 40.36 h - Expenditure for each physical follow-up: Rs. 5117.10 for travel and Rs. 3079.06 for lodging.
Ghoshal et al., 2019 [23]	Cross-sectional study	- India - ≥ 18 years - Male and female	Cancer	Advanced cancer patients' decision making about treatment were measured in a palliative care unit. Control group: N/A	<ul style="list-style-type: none"> - Shared, active, and passive Decisional Control Preferences (DCP) was 20.7%, 26.7%, and 52.7%, respectively. - 27.3% felt that the doctor should make a shared decision with the patient, - 34% patients felt that the family should be involved in decision making. - 32.7% make the decisions with the family after consulting with the doctor. - 59.3% actual treatment decisions were passive, whereas 21.3% were actively taken by the patient.
Shams et al., 2018 [28]	Cross sectional study	- Karachi, Pakistan. - 20–60+ years - Female	Breast and gynaecological cancer	Intervention group: Structured supportive care (physical and psychosocial counselling, mind diversion activities) for patients taking chemotherapy for 6 weeks. Control group: N/A	<ul style="list-style-type: none"> - Improved self-care behaviour, physical and psychological health and satisfaction among the intervention participants. - Almost all participants were satisfied with the program. - Intervention gave emotional support and helps the participants to ventilate their feelings. - 82.4% thinks program has positively influenced their life. - 94.1% said program helped them in accepting the disease and its treatment. - 94.1% said it helped them in controlling worrying thoughts. - 82.4% said it helped them to control low moods. - 94.1% participants' outlook towards their lives have changed positively. - 76.5% women's interest towards life has increased.

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Table 1 (continued)

Study identifier	Study design	Geographic location, population, age, gender	NCD type	Intervention	Outcome/Result
Nayak et al., 2005 [27]	Nonrandomized Before-after intervention study	- Cuttack, India - Pre: 28–79 years - Post: 23–81 years - Male and female	Cancer	Communication strategy for service providers developed and implemented Control group: N/A	<ul style="list-style-type: none"> - 70.6% women have practiced positive coping strategies in their daily life, that they learned from weekly sessions. - Knowledge enhanced: physical (82.4%), psychological (88.2%) and sexual health (76.5%) - Allowing enough time for the patient and families 1st step: 22%, 3rd step: 42% (p < 0.001) - Doctor’s attitude towards clarification of issues 1st step: 26%, 3rd step: 56% (p < 0.001) - Use of clear language 1st step: 14%, 3rd step: 57% (p < 0.001) - Privacy during consultation 1st step: 5%, 3rd step: 70% (p < 0.001) - No interruption during consultation 1st step: 42%, 3rd step: 82% (p < 0.001) - Overall satisfaction with communication 1st step: 13%, 3rd step: 33% (p < 0.001).
Tovey et al., 2005 [29]	Cross-sectional study	- Lahore, Pakistan - Age group not mentioned - Male and female	Cancer	Cancer patients were asked in four different hospitals about their satisfaction towards using traditional medicine (TM) and Complimentary Alternative Medicine (CAM) beside allopathic medicine. Control group: N/A	<ul style="list-style-type: none"> - Most used CAM/TMs by cancer patients’ in Pakistan are Dam Darood (70.4%), and spiritual healing (47.2%) and Hakeem (35%). - 84% of the cancer patients had used 1 or more forms of TM in combination with conventional treatments. - To the patients, CAM/TMs are also thought to be effective and very effective (Dam Darood 57%, spiritual healing 26% and Hakeem 22%) beside medical specialists (94%) and general practitioners (78%). - 58% patients were satisfied with the cancer treatment of homeopathy.

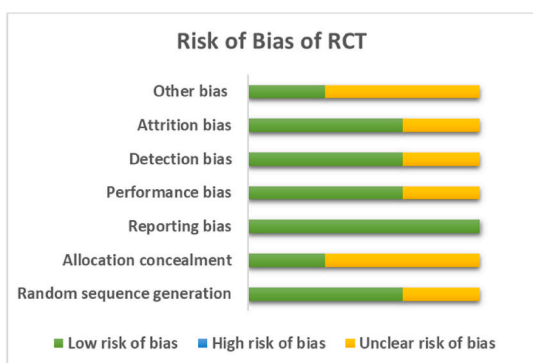


Fig. 2. Risk of bias of Randomized Controlled Trials.

satisfaction (63%) related to the interpersonal relationship with their service provider (3.2 ± 0.5). Around 70% of patients were also satisfied with the overall communication (3.3 ± 0.5) even though issues such as long waiting times, shortage of beds and, long-distance to a specialized hospital are present [25]. However, one of the excluded studies discussed how the decision-making process around treatment could be influenced [34]. It was identified that a specialized palliative care unit could help patients with making decisions related to treatment by consulting with the specialized doctor [34].

Intervention related to diabetes and its outcome: Three among thirteen studies discussed interventions that ensure QoC around diabetic

care. For maintaining QoC in service provision the included studies discussed different approaches such as employing diabetic care specific HW, providing diabetic education and care, and initiating specialized service for diabetes [21,24,30].

Diabetes-specific health workers: It was found through a 2.5 year-long RCT [21], that HWs specialized in diabetic care resulted in improved and continuous care. This RCT employed diabetes care-specific HW who communicated with a diabetic patient from the intervention group every month over the phone and organized a follow-up visit once every three months, in addition to regular visits to the physician. HWs also developed a management plan for patients by looking at patients’ laboratory tests, treatment plans, and discuss them with the doctors. Because of the follow-up and care of the diabetes care-specific HWs, patients of the intervention group achieved the study objective [21].

Diabetes related education: An RCT conducted in Nepal had three arms, where two were intervention arms (named as test 1 and test 2 group), and one was a control arm [30]. Both intervention groups received diabetes-related educational materials, whereas participants in test 2 received diabetic kits along with educational materials. Due to this intervention, the satisfaction score among the intervention group had increased after 12 months when compared to the control group. The second intervention group received an extra diabetic kit along with education materials, which increased their satisfaction scores even more [30].

A qualitative study conducted by Lewis and Newell discussed the available diabetic care from BIRDEM (Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine, and Metabolic Disorders),

BADAS (Diabetic Association of Bangladesh), district health complexes, community clinics in the rural area, and the slums of Bangladesh [24]. Unlike BADAS, BIRDEM provides a comprehensive awareness program, written and verbal information. It also discussed the limitations of a specialized center for diabetes care in Bangladesh and the high cost of diabetes care outside of BIRDEM. They emphasized the lack of access to clinics with appropriate facilities for diabetic care for people living in rural areas and subdistrict levels. A specialized diabetes center could raise awareness on diabetes management and the availability of comprehensive check-ups (full cardiovascular, renal, and eyesight examinations) and proper health education, which could minimize the risk for future complications in diabetic patients [24].

Intervention related to CVD and its outcome: To maintain QoC around CVD, a study included in this review discussed a community-based screening service, where a unique, hand-held tele-ECG machine was used. As early diagnosis and screening of CVD are difficult for people living in rural areas, community-based screening services with tele-ECG machines screened patients with acute myocardial infarction which allowed them to get instant service from a specialized doctor. It achieved a 95% satisfaction rate for people living in remote areas as well [33].

4. Discussions

Among the four major NCDs, approaches around three NCDs (cancer, diabetes, CVD) were derived from the search, and studies related to Chronic respiratory disease were not retrieved in this review. The most important approach found from included studies of this review were community-based screening and early detection, community-based m-Health, patient follow-up, and health education through HW, the establishment of specialized hospitals or corners for NCDs, communication training for service providers, and services that provide extra support for patients.

This systematic rapid review found that availability of services (screening, early detection, and regular check-up) near to the community increase the accessibility, affordability, and patient satisfaction [31–33] which is similar to a study conducted in Malawi, that showed the lack of accessibility, affordability of transportation, service fee, and, poverty hinders the uptake of NCD services. Therefore, to ensure QoC, NCD services need to be established close to the community so that people can have improved access as well as be more equitable for women and the poor [35].

It was also found through this review that community-based screening services allow patients to have the opportunity to detect existing diseases and seek next-level treatment if needed [31]. These findings are also supported by a review conducted by Kösters and Gøtzsche, that breast cancer screening was associated with an estimated 88% increase in seeking a biopsy compared to the control group (RR 1.88, 95% CI 1.77–1.99) [36].

This review suggested a strong approach to ensure QoC around diabetic care, which is HW associated with patient follow-up and health education provision [21,30]. A systematic review conducted in sub-Saharan Africa found similar findings, where counselling and health education on diet, exercise, and smoking cessation significantly decreased HbA1c levels from $10.6 \pm 4.2\%$ to $7.6 \pm 2.3\%$ ($p < 0.001$) [37].

Comprehensive education programs and booklet distribution (verbal and written) on NCDs were also found as strong instruments to maintain QoC in this review [24] which is aligned with a patient-centered education intervention through booklet distribution among heart failure patients in Mulago Hospital, Kampala, Uganda. It showed positive improvements in patient satisfaction (16%–79%, $p < 0.001$), awareness of their present health condition (80%, $p < 0.0001$), self-care management, and disease prevention (83%, $p < 0.0001$) came due to the intervention [38].

The current review revealed that maintaining patient privacy, confidentiality, and adequate time with the patient during the

consultation is crucial for ensuring patient satisfaction [27] which are also comparable with a systematic review on family planning conducted in the African context [39]. This review suggested provision of communication training for the service provider can increase client satisfaction, which is important to maintain QoC in service provision [27]. A study that took place in Kazakhstan also recommended the same for improving doctor-patient relationships for better adherence to treatment [40].

Despite having limited evidence in QoC around NCD services in South Asia, this systematic rapid review provides few policy and research implications. Community and clinic-based low-cost screening services ornate with the referral, and regular follow-up might ensure QoC. Provision of NCD-related health education, setting up specialized NCD services embedded with laboratory facilities, treatment procedures, health education, and awareness related to NCDs need to be initiated.

This systematic rapid review highlighted the lack of experimental studies which might ensure QoC around NCD service delivery in South Asia. Studies on chronic respiratory disease and studies from Maldives, Bhutan, and Afghanistan were absent here. Experimental intervention studies on QoC around NCD service delivery are limited in South Asia. We recommend more experimental and intervention studies on QoC around NCD service delivery in South Asia.

Strength and limitations: The strength of this systematic rapid review is the robustness of the methods following the WHO & PRISMA guidelines. However, there are some limitations as well. The language restriction might have missed some articles. To our knowledge, scientific articles are published in English in South Asian countries. The other limitation is the lack of meta-analysis due to the heterogeneity of the outcome in the included studies.

Conclusions: South Asian countries have a high NCD burden yet QoC around NCD services have been neglected. The interventions for improving QoC around NCD services described in this review could be scaled up in different settings in South Asia. Multiple stakeholders across different sectors could focus on this review for future health programs implementation and alleviate the burden of NCDs from South Asia.

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Availability of data and materials

All data generated or analysed during this study are included in this published article (and its supplementary information files).

Conflict of interest

Authors declared no conflict of interest.

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Authors' contributions

SE and KMSUR conceptualized the systematic review. SE drafted the manuscript with potential inputs from KMSUR. KMSUR critically reviewed the manuscript. All authors revised and approved the final manuscript.

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List of abbreviations

COPD	Chronic obstructive pulmonary disease
JBI	Joanna Briggs Institute
LMICs	Low and middle-income countries
NCDs	Non-communicable diseases
PRISMA	Preferred reporting items for systematic review and meta-analysis
PROSPERO	International prospective register of systematic reviews
PHC	Primary health care
QoC	Quality of care
RCTs	Randomized controlled trials
SDG	Sustainable development goal
UHC	Universal health coverage
WHO	World Health Organization

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.puhip.2021.100180>.

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