

Quality of Care among Non-Communicable Diseases (NCDs) Service Delivery in South Asia: A Systematic Rapid Review

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Abstract

Background: South Asia is facing the challenges of non-communicable diseases (NCDs) which are getting doubled due to the low quality of care (QoC) around NCD services. This systematic rapid review aims to unpack available approaches to establish the quality of care around NCD services and the impact of those approaches to reduce NCD burden in South Asian countries.

Methods: Three electronic databases (Medline, Embase, and the Cochrane Library) were searched. Studies published from 1st January 1990 to 31st December 2020 were included. Studies written 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: The effective interventions for improving QoC around NCD services can be scaled up in different settings in South Asia to reduce the burden of NCDs.

Background:

Worldwide non-communicable diseases (NCDs) have become the leading cause of premature death due to the global epidemiological transition. In 2016, worldwide 56.9 million deaths occurred and NCDs attributed 71% (40.5 million) of that total death. Premature deaths due to NCDs in low- and middle-income countries (LMICs) was accounted for 46% of 31.5 million deaths ¹.

Unsurprisingly, 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 44–84%. NCD related premature deaths statistics in these countries share a similar trajectory ².

People of South Asia is suffering from all four major types of NCDs. Recent cancer statistics showed that 1 million out of 1.3 billion people were diagnosed with cancer annually in India and in 2012 and 600,000 to 700,000 deaths attributed to cancer. However, 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 faced a quadrupled risk of developing diabetes, compared to other ethnic groups, and the changed lifestyle of people living in this continent make 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 in the whole world in 2015, 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 cause of death ⁹ and in LMICs > 90% of deaths are the reason for Chronic obstructive pulmonary disease (COPD) ¹⁰. Chronic respiratory disease accounted for 3% - 11% of total NCD-

related deaths in South Asia ². Due to the huge 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-centred” for achieving QoC in health care services ¹⁴.

There are limited studies where QoC around NCD services were discussed concurrently. A systematic review reported only one study which provided the idea 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 to ensure QoC for NCD services in South Asia was identified. As a result, this review is essential because of the high NCD burden, and little attention to QoC around NCD services. Thus, this 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.

Methods:

A systematic rapid review was done 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 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 review.

Comparison and type of studies

No comparison group was required in studies included in this 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 review was not limited to any study design and considered studies published in the English language only. The timeline of this review ranged from 1st January 1990 to 31st December 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 was 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 Joanna Briggs Institute (JBI) Critical Appraisal tool was used to assess the quality of other studies. For 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 the 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 review and no patients are directly involved in the process.

Results:

Systematic review process

Initially 829 studies were identified from three databases from which 13 studies were considered for final analysis.

Figure: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), and Bangladesh, Nepal, and Sri Lanka (n = 1). No studies were found from Afghanistan, Bhutan, or the Maldives. Most of the (n = 10) intervention took place at the hospital or clinic level ²¹⁻³⁰ whereas some (n = 3) were based on 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).

Table 1
Characteristics of included studies:

Study identifier	Study Design	Geographic Location, Population age and gender	NCD type	Intervention	Outcome/Result
Ali et al., 2016	Parallel, open-label, pragmatic RCT	<ul style="list-style-type: none"> - Diabetes clinics in India and Pakistan - 35 + years - Male & Female 	Diabetes	<p>Intervention: Regular physician's care, diabetes specific care coordinator's service through monthly phone call and follow-up visit</p> <p>once in three months.</p> <p>Control: Regular physician's care only.</p>	<p>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)</p> <p>Intervention vs. Control: 21.5% vs. 11.1%. (RR, 1.93 [95% CI, 1.52 to 2.45])</p> <p>BP: Baseline: 143.3/81.7mm Hg, Intervention and control group difference < 130/80 mm Hg: 12 month: 1.7% (P = 0.56) 30 month: 9.2% (P = 0.002)</p> <p>Intervention vs. Control: 51.0% vs. 45.0%; (RR, 1.14 [CI, 1.04 to 1.26])</p> <p>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</p>

Study identifier	Study Design	Geographic Location, Population age and gender	NCD type	Intervention	Outcome/Result
					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])
Upadhyay et al., 2015	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	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
Lewis and Newell	Qualitative	- Dhaka	Type 2	Discussed	- BIRDEM

Study identifier	Study Design	Geographic Location, Population age and gender	NCD type	Intervention	Outcome/Result
et al, 2014	study	metropolitan City & Sylhet division, Bangladesh - Age group not mentioned - Male and female	Diabetes	about available diabetes care in different setting in Bangladesh. Control group: N/A	<p>provides comprehensive education program (verbal and written) on diabetes care and patients have good awareness.</p> <p>- Only the BIRDEM clinic situated in capital offered regular comprehensive check-ups (full cardiovascular, renal and eyesight examinations).</p> <p>- Limited knowledge among patients who take service from specialist centres due to lack of getting proper diabetes guideline.</p> <p>- Rural Upazilla-level clinics contains limited resources to manage diabetes.</p> <p>-High service cost, resource limitation, long waiting line creates limitation to provide comprehensive treatment for service providers.</p> <p>- Poor diabetes management in rural and peri-urban area due to high service cost.</p>

Study identifier	Study Design	Geographic Location, Population age and gender	NCD type	Intervention	Outcome/Result
					- 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.

Study identifier	Study Design	Geographic Location, Population age and gender	NCD type	Intervention	Outcome/Result
Sing et al. 2014	Cross sectional study	<ul style="list-style-type: none"> - Chandigarh, India - Mean age 31.49 - Gender not mentioned 	Cardiovascular disease	<p>Intervening mobile phone and Bluetooth operated handheld tele-ECG machine in community level.</p> <p>Control group: N/A</p>	<ul style="list-style-type: none"> - 100% accuracy of transmission rate of tele-ECG from handheld machine to mobile phone. - Tele-ECG result was transmitted to expert physicians based in 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.

Study identifier	Study Design	Geographic Location, Population age and gender	NCD type	Intervention	Outcome/Result
Basu et al., 2006	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	- 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	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)

Study identifier	Study Design	Geographic Location, Population age and gender	NCD type	Intervention	Outcome/Result
					<p>- Oral cancer incidence in result of four repeated screening among all eligible people: mortality HR 0.76,95% CI (0.49–1.17)</p> <p>- Oral cancer mortality rate in result of four repeated screening among all eligible people: Mortality HR 0.21, 95% CI (0.13–0.35)</p> <p>- 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)</p> <p>- 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).</p>

Study identifier	Study Design	Geographic Location, Population age and gender	NCD type	Intervention	Outcome/Result
Mahapatra et al., 2016	Crosssectional study	<ul style="list-style-type: none"> - Odisha, India - 21–40 years - Male and female 	Cancer	<p>Oncology services provision in specialty hospitals in Odisha, India.</p> <p>Control group: N/A</p>	<ul style="list-style-type: none"> - 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	Cross-sectional study	<ul style="list-style-type: none"> - Gampaha, Western province of Sri Lanka - 35–39 years - Female 	Breast cancer	<p>Clinic based early detection service for breast cancer were provided. Then, assessment was done on coverage, quality and client satisfaction.</p> <p>Control group: N/A</p>	<p>Coverage:</p> <ul style="list-style-type: none"> - Clinical Breast Examination coverage increased from 1.1% -2.2% between 2003–2007. - Proportion of breast abnormalities detected on 2007: 1.8%. - Proportion referred for further care detected with breast abnormalities: 86.8%.

Study identifier	Study Design	Geographic Location, Population age and gender	NCD type	Intervention	Quality: Outcome/Result
					<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: - Politeness displayed by the health care workers: 98%, - Privacy while conducting CBE: 86%, - Time spent on CBE: 97%, - Health education on BSE: 98%
Mathew et al., 2017	Cross sectional study	<ul style="list-style-type: none"> - Mumbai, India - 30–79 years - Male and female 	Lung Cancer	<ul style="list-style-type: none"> Telephonic follow-up for cancer patients with planned treatment was introduced. Control group: N/A 	<ul style="list-style-type: none"> - Agreement between the telephonic and physical impression of disease: Substantial strength - Accuracy of telephonic versus physical follow-up: Among seven follow-up, five showed substantial strength (PABAK

Study identifier	Study Design	Geographic Location, Population age and gender	NCD type	Intervention	Outcome/Result
					<p>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).</p> <p>- Satisfaction score:</p> <p>Telephonic follow-up: 8</p> <p>Physical follow-up: 9</p> <p>- Negative correlation between time spent in telephonic follow-up and patient satisfaction: (r = - 0.147, P = 0.002).</p> <p>- Anxiety reduction after physical follow-up: 70.27%</p> <p>- Mean time spent for physical follow-up: 40.36 hour</p> <p>- Expenditure for each physical follow-up: Rs. 5117.10 for travel and Rs. 3079.06 for lodging.</p>

Study identifier	Study Design	Geographic Location, Population age and gender	NCD type	Intervention	Outcome/Result
Ghoshal et al. 2019	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	- 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	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	- Improved selfcare behaviour, physical and psychological health and satisfaction among the intervention participants. - Almost all participants were satisfied with the program. - Intervention gave emotional support and

Study identifier	Study Design	Geographic Location, Population age and gender	NCD type	Intervention	Outcome/Result
					<p>helps the participants to ventilate their feelings.</p> <p>- 82.4% thinks program has positively influenced their life.</p> <p>- 94.1% said program helped them in accepting the disease and its treatment.</p> <p>- 94.1% said it helped them in controlling worrying thoughts.</p> <p>- 82.4% said it helped them to control low moods.</p> <p>- 94.1% participants' outlook towards their lives have changed positively.</p> <p>- 76.5% women's interest towards life has increased.</p> <p>- 70.6% women have practiced positive coping strategies in their daily life, that they learned from weekly sessions.</p> <p>- Knowledge enhanced: physical (82.4%), psychological (88.2%) and</p>

Study identifier	Study Design	Geographic Location, Population age and gender	NCD type	Intervention	Outcome/Result
					sexual health (76.5%)
Nayak et al., 2005	Nonrandomized Before-after intervention study	<ul style="list-style-type: none"> - Cuttack, India - Pre: 28–79 years - Post: 23–81 years - Male and female 	Cancer	<p>Communication strategy for service providers developed and implemented</p> <p>Control group: N/A</p>	<ul style="list-style-type: none"> - Allowing enough time for the patient and families 1st step: 22%, 3rd step: 42% (p < .001) - Doctor's attitude towards clarification of issues 1st step: 26%, 3rd step: 56% (p < .001) - Use of clear language 1st step: 14%, 3rd step: 57% (p < .001) -Privacy during consultation 1st step: 5%, 3rd step: 70% (p < .001) -No interruption during consultation 1st step: 42%, 3rd step: 82% (p < .001) - Overall satisfaction with communication 1st step: 13%, 3rd step: 33% (p < .001).

Study identifier	Study Design	Geographic Location, Population age and gender	NCD type	Intervention	Outcome/Result
Tovey et al., 2005	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	- 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.

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 studies 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 study³². The remaining RCT did not mention any of the bias except the primary outcome and attrition rate³⁰. 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 study²⁹ was found to have poor quality. As per the adapted grading system, the qualitative study²⁴ and non-randomized before-after intervention study²⁷ were graded as the good quality study as well. Studies that were assessed as a good quality study had an adequate answer for study setting, sample size and sampling method, valid and reliable statistical analysis, and reporting system, ethical consideration and managing 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 services²² to improve QoC for cancer patients.

A community-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 increases the availability of service provision to village women and treatment compliance and reduce the incidence and severity of advanced cervical cancer. 64.7% of women were satisfied while 5.6% were very satisfied with the services. 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 cases³¹.

15 years 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 awareness³². 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.

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) was 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%). Clinic-based breast cancer detection program has helped to increase breast cancer detection and service coverage from 1.1% -2.2% between 2003–2007. Referral service increase and 86.8% of women who were detected with breast abnormalities were referred for further care²².

In one study, telephonic follow-up beside 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 reduction in anxiety when they attended a physical follow-up²⁶.

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. increases. 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.

It was explored through one study that improved communication skills of service providers can increase patient's satisfaction around their behaviour. Three staged-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.

Two studies discussed how a specialized hospital and palliative care centre for cancer could serve patients in a more engaging way ²⁵ and how the decision-making process around treatment could be influenced ³⁴. Services from a specialized cancer hospital had increased patient satisfaction (63%) related to the interpersonal relationship with their service provider (3.2 ± 0.5). 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. 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}.

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 diabetes care specific HW's patient follow-up and care, patients of the intervention group achieved the study objective ²¹.

Another 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 education materials, whereas participants in test 2 received diabetic kits along with educational materials. Due to this intervention, the satisfaction score among the intervention group has 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.

Through a qualitative study conducted by Lewis and Newell discussed the available diabetic care from BIRDEM, BADAS, 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 level. 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, 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 handheld 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 and they got immediate service from a specialized doctor. It achieved a 95% satisfaction rate for people living in remote areas as well ³³.

Discussions:

Among four major NCDs, approaches around three NCDs (cancer, diabetes, CVD) were derived from the search, and studies related to Chronic respiratory disease was 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 hospital or corner for NCDs, communication training for service providers, and services that provide extra support for patients.

This 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 hinder the uptake of NCD services. Therefore, to ensure QoC, NCD services need to be close to the community so that people can have improved access to these services and allow it to 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 done 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 +/- 4.2% to 7.6 +/- 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% to 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 review provides few practical research implications. Community and clinic-based services ornate with the referral, regular follow-up might ensure QoC. In addition to this, NCD related health education, setting up specialized NCD services could be other options. Besides, more research on this field is required as the limited number of experimental studies has been derived from this review.

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 to further implement health programs and alleviate the burden of NCDs in South Asia.

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

Declarations

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).

Competing interests:

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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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References

1. WHO. Global Health Observatory (GHO) data: NCD mortality and morbidity 2019. Available from: https://www.who.int/gho/ncd/mortality_morbidity/en/.
2. WHO. Noncommunicable diseases country profiles 2018. Geneva: World Health Organization; 2018.
3. Mallath MK, Taylor DG, Badwe RA, Rath GK, Shanta V, Pramesh C, et al. The growing burden of cancer in India: epidemiology and social context. *The Lancet Oncology*. 2014;15(6):e205-e12.
4. Ramachandran A, Snehalatha C, Shetty AS, Nanditha A. Trends in prevalence of diabetes in Asian countries. *World journal of diabetes*. 2012;3(6):110.
5. Rosella LC, Mustard CA, Stukel TA, Corey P, Hux J, Roos L, et al. The role of ethnicity in predicting diabetes risk at the population level. *Ethnicity & health*. 2012;17(4):419-37.
6. Kakar Z, Siddiqui M, Amin R. Prevalence and risk factors of diabetes in adult population of South Asia. *Clinical Medicine and Diagnostics*. 2013;3(2):18-28.
7. WHO. Cardiovascular diseases (CVDs): Fact sheets 2017 [27th May, 2019]. Available from: [https://www.who.int/en/news-room/fact-sheets/detail/cardiovascular-diseases-\(cvds\)](https://www.who.int/en/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds)).

8. World Life Expectancy. World Health Ranking 2017 [Available from: <https://www.worldlifeexpectancy.com/world-health-rankings>].
9. Lozano R, Naghavi M, Foreman K, Lim S, Shibuya K, Aboyans V, et al. Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the Global Burden of Disease Study 2010. *The Lancet*. 2012;380(9859):2095-128.
10. WHO. Chronic obstructive pulmonary disease (COPD): Fact sheets 2017 [cited 2019 27th May]. Available from: [https://www.who.int/en/news-room/fact-sheets/detail/chronic-obstructive-pulmonary-disease-\(copd\)](https://www.who.int/en/news-room/fact-sheets/detail/chronic-obstructive-pulmonary-disease-(copd)).
11. UN. Sustainable Development Goals 2015 [Available from: <https://www.un.org/sustainabledevelopment/sustainable-development-goals/>].
12. Siegel KR, Patel SA, Ali MK. Non-communicable diseases in South Asia: contemporary perspectives. *British Medical Bulletin*. 2014;111(1):31-44.
13. Kruk ME, Gage AD, Arsenault C, Jordan K, Leslie HH, Roder-DeWan S, et al. High-quality health systems in the Sustainable Development Goals era: time for a revolution. *The Lancet Global Health*. 2018;6(11):e1196-e252.
14. Bengoa R, Kawar R, Key P, Leatherman S, Massoud R, Saturno P. Quality of care: A process for making strategic choices in health systems. Geneva: World Health Organization. WHO press; 2006.
15. Brocklehurst P, Kujan O, O'Malley LA, Ogden G, Shepherd S, Glennly AM. Screening programmes for the early detection and prevention of oral cancer. *Cochrane database of systematic reviews*. 2013(11).
16. Hanlon P, Yeoman L, Gibson L, Esiovwa R, Williamson AE, Mair FS, et al. A systematic review of interventions by healthcare professionals to improve management of non-communicable diseases and communicable diseases requiring long-term care in adults who are homeless. *BMJ open*. 2018;8(4):e020161.
17. Bleich SN, Koehlmoos TL, Rashid M, Peters DH, Anderson G. Noncommunicable chronic disease in Bangladesh: overview of existing programs and priorities going forward. *Health policy*. 2011;100(2-3):282-9.
18. Tricco AC, Langlois E, Straus SE. Rapid reviews to strengthen health policy and systems: a practical guide: World Health Organization; 2017.
19. Popay J, Roberts H, Sowden A, Petticrew M, Arai L, Rodgers M, et al. Guidance on the conduct of narrative synthesis in systematic reviews. A product from the ESRC methods programme Version. 2006;1:b92.
20. Snilstveit B, Oliver S, Vojtkova M. Narrative approaches to systematic review and synthesis of evidence for international development policy and practice. *Journal of development effectiveness*. 2012;4(3):409-29.
21. Ali MK, Singh K, Kondal D, Devarajan R, Patel SA, Shivashankar R, et al. Effectiveness of a multicomponent quality improvement strategy to improve achievement of diabetes care goals: a randomized, controlled trial. *Annals of internal medicine*. 2016;165(6):399-408.
22. Vithana PVSC, Ariyaratne M, Jayawardana P. Quality of breast cancer early detection services conducted by Well Woman Clinics in the district of Gampaha, Sri Lanka. *Asian Pacific Journal of Cancer Prevention*. 2013;14(1):75-80.
23. Ghoshal A, Damani A, Muckaden M, Yennurajalingam S, Salins N, Deodhar J. Patient's Decisional Control Preferences of a Cohort of Patients With Advanced Cancer Receiving Palliative Care in India. *Journal of palliative care*. 2019;34(3):175-80.
24. Lewis, Newell. Patients' perspectives of care for type 2 diabetes in Bangladesh—a qualitative study. *BMC public health*. 2014;14(1):737.
25. Mahapatra S, Nayak S, Pati S. Quality of care in cancer: An exploration of patient perspectives. *Journal of family medicine and primary care*. 2016;5(2):338.

26. Mathew A, Agarwal J, Munshi A, Laskar S, Pramesh C, Karimundackal G, et al. A prospective study of telephonic contact and subsequent physical follow-up of radically treated lung cancer patients. *Indian journal of cancer*. 2017;54(1):241-52.
27. Nayak, Pradhan JPB, Reddy S, Palmer JL, Zhang T, Bruera E. Cancer patients' perception of the quality of communication before and after the implementation of a communication strategy in a regional cancer center in India. *Journal of clinical oncology*. 2005;23(21):4771-5.
28. Shams S, Jabbar AA, Nanji K, Jan R, Tharani A. Influence of supportive care on chemotherapy patients' self-care behaviour and satisfaction: A pilot study conducted in Karachi, Pakistan. *Indian journal of cancer*. 2018;55(1):115-21.
29. Tovey P, Broom A, Chatwin J, Hafeez M, Ahmad S. Patient assessment of effectiveness and satisfaction with traditional medicine, globalized complementary and alternative medicines, and allopathic medicines for cancer in Pakistan. *Integrative Cancer Therapies*. 2005;4(3):242-8.
30. Upadhyay DK, Ibrahim MIM, Mishra P, Alurkar VM. A non-clinical randomised controlled trial to assess the impact of pharmaceutical care intervention on satisfaction level of newly diagnosed diabetes mellitus patients in a tertiary care teaching hospital in Nepal. *BMC health services research*. 2015;15(1):57.
31. Basu P, Ghoshal M, Chattopadhyay K, Mittal S, Das P, Choudhury D, et al. Cervical screening by visual inspection with acetic acid (VIA) is well accepted by women—results from a community-based study in rural India. *Asian Pac J Cancer Prev*. 2006;7(4):604-8.
32. Sankaranarayanan R, Ramadas K, Thara S, Muwonge R, Thomas G, Anju G, et al. Long term effect of visual screening on oral cancer incidence and mortality in a randomized trial in Kerala, India. *Oral oncology*. 2013;49(4):314-21.
33. Singh M, Agarwal A, Sinha V, Manoj Kumar R, Jaiswal N, Jindal I, et al. Application of Handheld Tele-ECG for Health Care Delivery in Rural India. *International Journal of Telemedicine and Applications*. 2014;2014:1-6.
34. Ghoshal A, Damani A, Muckaden M, Yennurajalingam S, Salins N, Deodhar J. Patient's Decisional Control Preferences of a Cohort of Patients With Advanced Cancer Receiving Palliative Care in India. *Journal of palliative care*. 2019;34 (3):175-80.
35. Wood R, Viljoen V, Van Der Merwe L, Mash R. Quality of care for patients with non-communicable diseases in the Dedza District, Malawi. *African journal of primary health care & family medicine*. 2015;7(1):1-8.
36. Kösters JP, Gøtzsche PC. Regular self-examination or clinical examination for early detection of breast cancer. *Cochrane Database of Systematic Reviews*. 2003(2).
37. Kane J, Landes M, Carroll C, Nolen A, Sodhi S. A systematic review of primary care models for non-communicable disease interventions in Sub-Saharan Africa. *BMC family practice*. 2017;18(1):46.
38. Siddharthan T, Nassali F, Kalyesubula R, Coca S, Rastegar A, Rabin T, et al. An educational booklet for patient-centred health education about a non-communicable disease in low-income and middle-income countries. *The Lancet Global Health*. 2016;4:S25.
39. Tessema GA, Gomersall JS, Mahmood MA, Laurence CO. Factors determining quality of care in family planning services in Africa: a systematic review of mixed evidence. *PLoS One*. 2016;11(11):e0165627.
40. Barbazza E, Yegeubayeva S, Akkazieva B, Tsoyi E, Zheleznyakov E, Tello JE. Improving clinical practice in primary care for the prevention and control of noncommunicable diseases: a multi-actor approach to two regional pilot projects in Kazakhstan. *Cardiovascular diagnosis and therapy*. 2019;9(2):129.

Figures

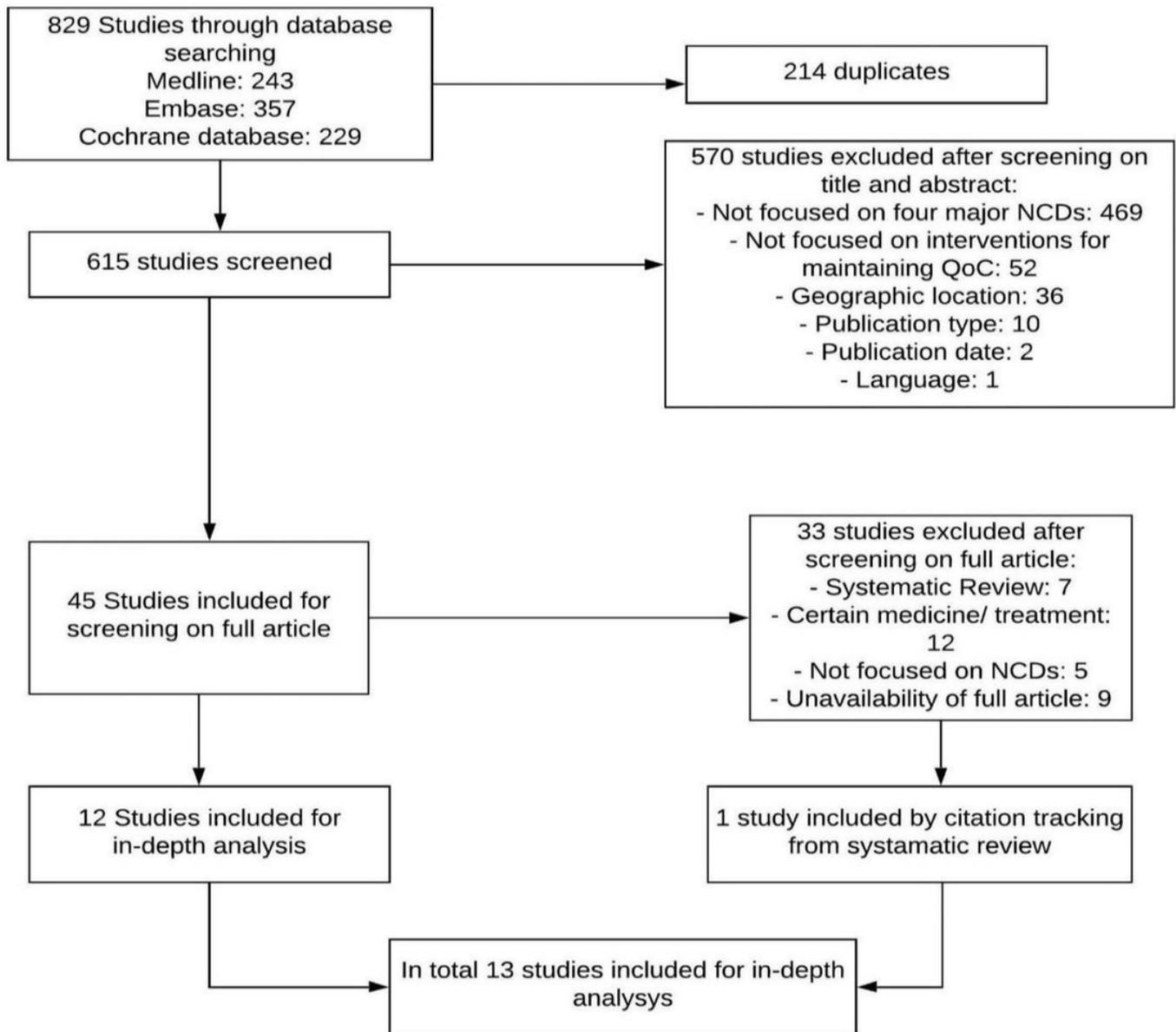


Figure 1

Flow chart (PRISMA diagram) of the study selection process

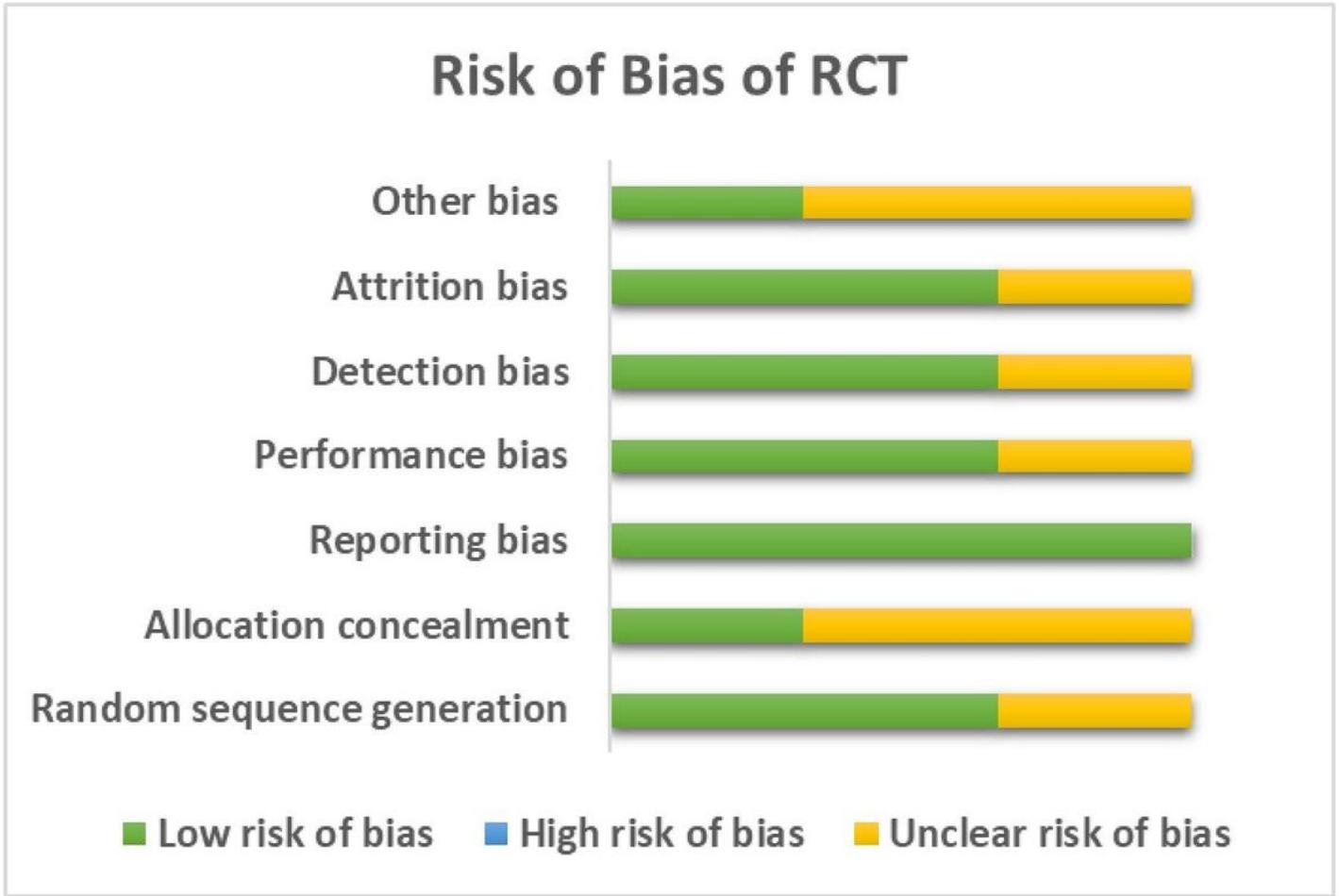


Figure 2

Risk of bias of Randomized Controlled Trials

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