Review

Understanding Gaps in the Hypertension and Diabetes Care Cascade: Systematic Scoping Review

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Abstract

Background: Hypertension and diabetes are global health challenges requiring effective management to mitigate their considerable burden. The successful management of hypertension and diabetes requires the completion of a sequence of stages, which are collectively termed the care cascade.

Objective: This scoping review aimed to describe the characteristics of studies on the hypertension and diabetes care cascade and identify potential interventions as well as factors that impact each stage of the care cascade.

Methods: The method of this scoping review has been guided by the framework by Arksey and O'Malley. We systematically searched MEDLINE, Embase, and Web of Science using terms pertinent to hypertension, diabetes, and specific stages of the care cascade. Articles published after 2011 were considered, and we included all studies that described the completion of at least one stage of the care cascade of hypertension and diabetes. Study selection was independently performed by 2 paired authors. Descriptive statistics were used to elucidate key patterns and trends. Inductive content analysis was performed to generate themes regarding the barriers and facilitators for improving the care cascade in hypertension and diabetes management.

Results: A total of 128 studies were included, with 42.2% (54/128) conducted in high-income countries. Of them, 47 (36.7%) focused on hypertension care, 63 (49.2%) focused on diabetes care, and only 18 (14.1%) reported on the care of both diseases. The majority (96/128, 75.0%) were observational in design. Cascade stages documented in the literature were awareness, screening, diagnosis, linkage to care, treatment, adherence to medication, and control. Most studies focused on the stages of treatment and control, while a relative paucity of studies examined the stages before treatment initiation (76/128, 59.4% vs 52/128, 40.6%). There was a wide spectrum of interventions aimed at enhancing the hypertension and diabetes care cascade. The analysis unveiled a multitude of individual-level and system-level factors influencing the successful completion of cascade sequences in both high-income and low- and middle-income settings.

Conclusions: This review offers a comprehensive understanding of hypertension and diabetes management, emphasizing the pivotal factors that impact each stage of care. Future research should focus on upstream cascade stages and context-specific interventions to optimize patient retention and care outcomes.

KEYWORDS

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Introduction

Noncommunicable diseases (NCDs) constitute a formidable global health challenge, accounting for approximately 80% of NCD-related deaths, and they include cardiovascular diseases, cancers, chronic respiratory diseases, and diabetes [1]. Hypertension is the most pivotal risk factor for cardiovascular diseases [2]. The prevalence of hypertension among adults aged 30-79 years worldwide is estimated to be 1.28 billion, with an alarming 700 million individuals unaware of their condition. Less than half of adults with hypertension are diagnosed and treated. Only approximately 1 in 5 adults with hypertension have their blood pressure controlled [3]. Similarly, the global prevalence of diabetes among adults has surged to 537 million in 2021, with nearly half of these cases (240 million) remaining undiagnosed. Moreover, the treatment rate for diabetes is suboptimal, with only 32.9% of patients receiving appropriate care and a mere 16.5% attaining treatment goals [4]. Evidence suggests that a substantial proportion of patients with hypertension and diabetes reside in low- and middle-income countries (LMICs), wherein the management of these conditions remains persistently low [3,5].

Hypertension and diabetes are often approached differently by distinct clinical subspecialties owing to their clinical complexities. However, it is essential to recognize that the management of these 2 conditions together can be highly beneficial owing to their shared risk factors and bidirectional interaction. The management of hypertension and diabetes also shares the same pathway, which includes early detection, appropriate treatment, and continuous monitoring. The health care systems and implementation strategies designed to ensure the continuity of care exhibit significant overlap and can be harnessed efficiently and effectively to support both hypertension and diabetes patients. The care cascade is a model for evaluating patient retention across sequential stages of care required to achieve a successful treatment outcome [6]. This model has sequential stages, including awareness, screening, diagnosis, appropriate management, and disease control, that patients navigate while accessing health care services. Acknowledging potential lapses at each stage, the care cascade model identifies critical stages where patients may disengage, hindering them from attaining disease control [7]. The care cascade model was originally conceived for HIV care [8]. It has since been extended to monitor and manage infectious diseases, such as hepatitis C [9] and tuberculosis [6], and has been more recently applied to NCDs [10].

The utility of studying the care cascade of hypertension and diabetes goes beyond the mere exploration of their clinical pathways. It encompasses a broader holistic perspective that includes not only clinical aspects but also the impact on health systems, the quality of life of affected individuals, and the efficiency of health care delivery. Cascade analysis for hypertension and diabetes can help understand the common factors that affect the care model in order to identify appropriate strategies to improve health care for these 2 conditions. However, there is limited evidence synthesis regarding the care cascade of hypertension and diabetes. Therefore, we performed a systematic scoping review with the goal of mapping and describing the current state of evidence on a global scale. We sought to understand the process of hypertension and diabetes management, identify the factors that influence each stage of the care cascade, and explore potential interventions that hold promise for improving care continuity. By synthesizing existing evidence, our findings seek to inform future research endeavors, propelling the advancement of management strategies for hypertension and diabetes.

Methods

Study Design

This scoping review was conducted following the stages of a scoping review by Arksey and O'Malley [11] and was reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) [12].

Identifying the Research Questions

This scoping review focused on mapping the existing evidence on the care cascade of hypertension and diabetes. The specific research questions were as follows:

1. How the care cascade model has been applied in hypertension and diabetes research?
2. Which stage of the hypertension and diabetes care cascade has the current research in high-income countries (HICs) and LMICs primarily focused on?
3. What are the barriers and facilitators of hypertension and diabetes care cascade completion?
4. What strategies have been employed to improve retention in the hypertension and diabetes care cascade?
5. What are the key knowledge gaps that remain in the literature about the hypertension and diabetes care cascade?

Identifying Relevant Studies

To identify relevant studies, a systematic search was conducted in MEDLINE, Embase, and Web of Science, using terms pertinent to hypertension, diabetes, and the specific stages of the care cascade. The framework of population, concept, and context was used to identify core concepts related to the research question and inform the search strategy [13]. A complete overview of the search terms for each database is provided in Multimedia Appendix 1. The population of interest in this review was adults aged 18 years or older who had been screened for or diagnosed with hypertension or type 2 diabetes, as well as patients with hypertension or type 2 diabetes undergoing treatment or management. The key concept of the review was the hypertension and diabetes care cascade, with a focus on studies explicitly applying the cascade care model to one or more stages of screening, diagnosis, treatment, and control. Articles describing interventions targeting specific stages of the cascade or factors influencing interventions or outcomes of at least one stage of the care cascade were included. The review aimed to explore a broad range of influencing factors involving both barriers and facilitators, with all pertinent descriptions included, regardless of statistical associations. The contextual scope of this review was in both HICs and LMICs, where hypertension and diabetes care was provided. The timeframe for database searches spanned from January 2011 to January

2023 since the concept of the care cascade was introduced in 2011 [8]. There was no restriction on publication language, allowing for an inclusive evaluation of relevant studies worldwide. The eligibility criteria are shown in Textbox 1.

Textbox 1. Eligibility criteria for screening.

1. Population: Adults aged 18 years or older who had been screened for or diagnosed with hypertension or type 2 diabetes and patients with known hypertension or type 2 diabetes currently undergoing treatment or management.

2. Concept: Hypertension and diabetes care cascade, with a focus on studies explicitly applying the cascade care model to one or more stages from awareness to control. Interventions that impact patient outcomes and factors that influence implementation outcomes and service outcomes within at least one stage of the care cascade.

3. Context: No limitation. All clinical and primary care settings.

4. Language: No limitation.

5. Published between January 1, 2011, and January 17, 2023.

6. Article type: Original articles and protocol papers, including cross-sectional studies, cohort studies, trials, and implementation studies published in peer-reviewed journals.

Study Selection

All identified articles were imported into Covidence, and duplicates were removed. Screening proceeded through 2 distinct stages, where titles and abstracts were assessed independently by 4 researchers (JW, FT, XY, and ZW) in pairs, adhering to predefined inclusion and exclusion criteria to determine potential eligibility. In the event of disagreements, a collaborative discussion within the research team swiftly resolved any discrepancies. Subsequently, full-text screening followed a similar process, again involving 4 researchers (JW, FT, YY, and ZW) in pairs. Articles were excluded if they were (1) observing outcomes unrelated to hypertension and type 2 diabetes health care; (2) case reports, conference abstracts, editorials, commentaries, or reviews; and (3) unavailable in full text. Any unresolved discrepancies in article eligibility were resolved by group discussion until a consensus was reached. Notably, to glean insights into ongoing or planned projects and to identify potential interventions and relevant factors, study protocols were intentionally retained and not excluded in the scoping review.

Charting the Data

A data-charting form was created in Microsoft Excel and pilot tested with 15 articles to establish clarity and consistency in data extraction variables across reviewers. Data extraction was performed by 4 researchers (JW, FT, YY, and ZW). The extracted variables included title, author names, year of publication, study countries, disease of interest (hypertension, diabetes, or both), study method (quantitative, qualitative, or mixed method), study design (cross-sectional study, cohort study, trial, or implementation study), sample size, mean age of participants, stages of the care cascade involved, interventions aimed at improving retention, factors associated with stage completion, and reported outcomes. The care of hypertension and diabetes was divided into multiple stages of the cascade, including awareness, screening, diagnosis, linkage to care, treatment, medication adherence, and ultimately, disease control. The world's economies were classified based on the World Bank classification as follows: low income, lower-middle income, upper-middle income, and high income [14]. The outcomes were categorized into implementation outcomes,

service outcomes, and client outcomes. Implementation outcomes encompassed aspects pertaining to the process of implementing interventions and services for hypertension and diabetes care. This included factors such as acceptability, adoption, appropriateness, cost, feasibility, fidelity, and sustainability of interventions to health care providers or patients. Service outcomes were those related to the quality and effectiveness of the health care services provided to patients with hypertension and diabetes, such as access to health care services, continuity of care, appropriateness of care, equity of service, and health care provider adherence to clinical guidelines. Client outcomes, on the other hand, delved into the impact of health services on patients' health and clinical conditions, such as blood pressure and blood glucose control, reductions in cardiovascular risk factors, and improvements in overall quality of life. To ensure data accuracy and consistency, a senior researcher (XY) reviewed all extracted data. Any disagreements were resolved by consensus.

Collating, Summarizing, and Reporting the Results

Interventions and influencing factors were analyzed by cascade stages and focused diseases. Studies that reported multiple stages of the care cascade were included in the synthesis of each relevant stage. The resulting information was subjected to rigorous quantitative analysis, employing frequencies and percentages to elucidate key patterns and trends. Inductive content analysis was performed to generate themes regarding the barriers and facilitators for improving the care cascade in hypertension and diabetes management. The initial list of codes was grouped into categories and then themes against the supporting evidence. Throughout this process, subthemes and themes were discussed and refined within the research team.

Ethical Considerations

This review does not involve human subject information, primary data collection, or any form of experimentation on individuals.

Results

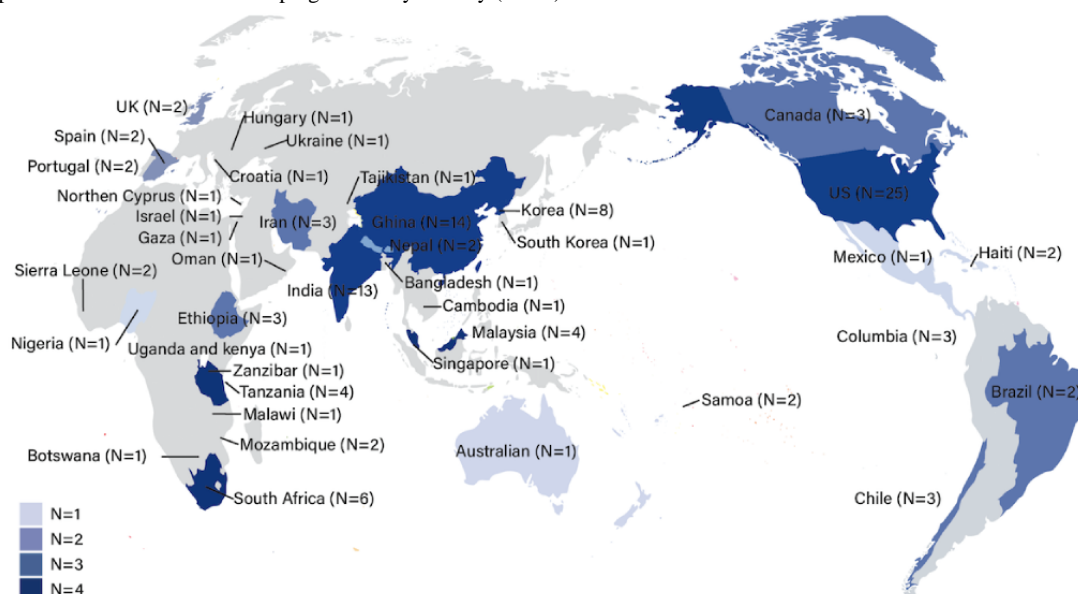### Characteristics of the Included Studies

Of the 1321 unique articles identified for the title and abstract screening, 222 were retrieved for full-text review. Of these, 128 were included in the analysis after excluding 94 articles for various reasons (Figure 1).

The 128 studies originated from 40 countries, with 42.2% (54/128) conducted in HICs (Figure 2). Of the 128 studies, 47 (36.7%) focused on hypertension care, 63 (49.2%) focused on diabetes care, and 18 (14.1%) reported on the care of both diseases. Most studies (104/128, 81.3%) employed quantitative methods. The majority were cross-sectional studies (70/128, 54.7%), followed by cohort studies (26/128, 20.3%). There were

24 (18.8%) trials evaluating interventions to promote retention in at least one cascade stage. Only 8 (6.3%) were implementation studies designed to systematically assess service delivery gaps and identify contextually appropriate solutions to address these bottlenecks. A total of 116 (90.6%) studies reported health receivers' perspectives, and only 8 (6.3%) studies had health system perspectives. Most studies (83/128, 64.8%) reported client outcomes as primary outcomes, and they mainly focused on the measure of the effectiveness of disease control. Moreover, 16 (12.5%) studies reported service outcomes, and they mainly focused on the measure of satisfaction. Furthermore, 29 (22.7%) studies reported implementation outcomes, such as feasibility, cost, and adoption (Table 1). Detailed characteristics of the 128 included studies are summarized in Multimedia Appendix 2 [10,15-131].

Figure 1. PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) flow diagram.
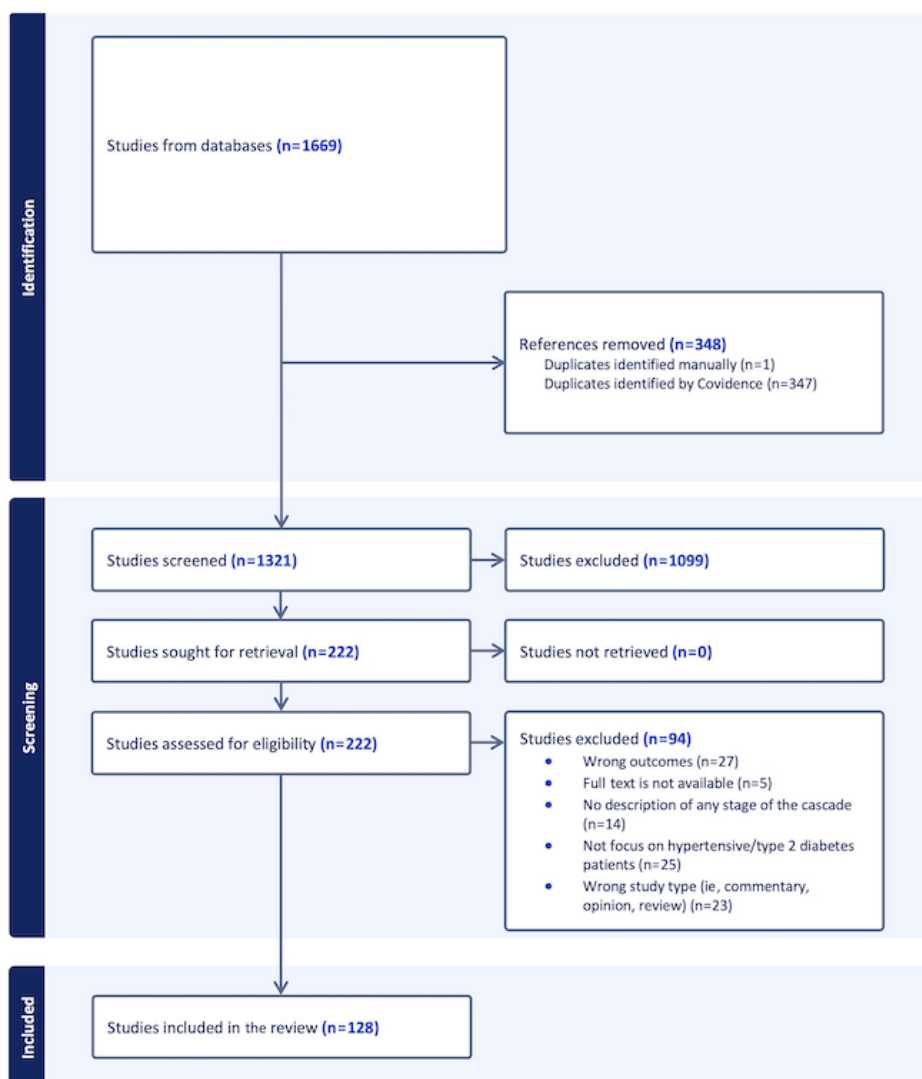
Figure 2. Map of studies included in the scoping review by country (N=40).

Table 1. Summary of the characteristics of the included studies.

Characteristic	Value (N=128), n (%)
Income level of countries	
High income	54 (42.2)
Upper-middle income	25 (19.5)
Lower-middle income	38 (29.7)
Low income	11 (8.6)
Disease	
Hypertension	47 (36.7)
Diabetes	63 (49.2)
Hypertension and diabetes	18 (14.1)
Study design	
Cross-sectional	70 (54.7)
Cohort	26 (20.3)
Interventional	24 (18.8)
Implementation	8 (6.2)
Participants	
Health receivers	116 (90.6)
Health providers	4 (3.1)
Health receivers and providers	8 (6.3)
Research methods	
Quantitative	104 (81.3)
Qualitative	11 (8.6)
Mixed	13 (10.1)
Outcomes	
Implementation	29 (22.7)
Service	16 (12.5)
Client	83 (64.8)

Completion of the Hypertension and Diabetes Care Cascade

Only 3 studies documented all 7 cascade stages, with 2 of them focusing on hypertension management and 1 addressing both hypertension and diabetes [15,16,132]. They were all population-based cross-sectional surveys aimed to describe disease prevalence and quantify the unmet need for hypertension and diabetes care. The remaining studies included in our analysis examined specific stages of the care cascade. Among the studies focusing on hypertension, 13 highlighted increasing awareness and knowledge related to hypertension, 8 addressed the importance of screening through blood pressure measurements, 14 focused on the diagnosis of hypertension, 13 explored the linkage to care, 34 discussed the initiation of treatment, 16 emphasized medication adherence, and 26 explored blood pressure management and control. For diabetes care, 8 studies addressed the critical aspect of awareness, 16 concentrated on screening, 20 discussed the diagnosis of diabetes, 21 explored the linkage to care, 38 focused on treatment interventions, 23 examined medication adherence, and 37 investigated the factors impacting diabetes control. In addition, 18 studies adopted an integrated approach, encompassing care for both hypertension and diabetes. Among these studies, 6 addressed awareness, 1 addressed screening, 4 addressed diagnosis, 10 addressed linkage to care, 9 addressed treatment, 2 addressed medication adherence, and 10 addressed control (Table 2).

Table 2. Studies across the stages of the care cascade.

Stage of the care cascade	Value, n (%)		
	Hypertension (n=47)	Diabetes (n=63)	Hypertension and diabetes (n=18)
Awareness	13 (27.7)	8 (12.7)	6 (33.3)
Screening	8 (17.0)	16 (25.4)	1 (5.6)
Diagnosis	14 (29.8)	20 (31.7)	4 (22.2)
Linkage to care	13 (27.7)	21 (33.3)	10 (55.6)
Treatment	34 (72.3)	38 (60.3)	9 (50.0)
Medication adherence	16 (34.0)	23 (36.5)	2 (11.1)
Control	26 (55.3)	37 (58.7)	10 (55.6)

Interventions of the Hypertension and Diabetes Care Cascade

Awareness

Various interventions were identified to enhance the knowledge of disease prevention. Health education programs for hypertension and diabetes were emphasized as continuous efforts to support ongoing management and care [17]. The provision of comprehensive education was achieved through training classes and consulting at nutrition-based shared medical appointments [17-19]. Automated outreach call services with the integration of electronic health records emerged as effective approaches [20]. Out-of-hospital continuous nursing interventions and community awareness campaigns were used to augment the awareness [21]. Dissemination of awareness campaign information occurred through various channels, including the internet, public awareness events, and targeted home visits [22].

Screening

In the pursuit of enhancing the screening process for hypertension and diabetes, a diverse array of interventions has emerged. The Sustainable East Africa Research in Community Health (SEARCH) study implemented a community health campaign that offered universal adult screening, rendering screening services widely accessible [23]. Moreover, innovative approaches like home-based screening interventions empowered individuals by providing convenience and ease of access to early detection services [24]. Early diabetes detection was prioritized through specialized medical check-ups, facilitating timely intervention [22]. The Integrated Tracking, Referral, and Electronic Decision Support and Care Coordination (I-TREC) program incorporated cutting-edge technologies, including electronic case record forms and clinical decision support systems, streamlining patient information and offering guideline-based screening. Enhanced training for health care providers in NCD management and lifestyle interventions further fortified the screening process [25]. Lastly, efforts were made to strengthen health education and outreach services, particularly targeting individuals without symptoms, to foster a proactive approach to screening [26].

Diagnosis

Effective interventions have been deployed to enhance the diagnosis of hypertension and diabetes. Continuous and coordinated care among multi-level health institutions was emphasized to enable timely diagnosis and consistent follow-up for hypertension and diabetes. Telephone peer coaching provided personalized support through weekly calls, aiding in timely diagnosis and empowering patients to engage in self-care [27]. Patient-centered integrated care with advanced technologies, such as electronic case record forms and clinical decision support systems, streamlined patient information and referrals to deliver tailored guideline-based care. Enhanced training for primary health care providers further strengthened timely diagnosis among patients [25].

Linkage to Care

Follow-up within 6 weeks at NCD clinics for participants with hypertension, coupled with the use of diabetes self-management record sheets and telephone reinforcement, has shown positive

outcomes [133]. Additionally, 8-week training classes encompassing diverse self-care aspects have demonstrated effectiveness [18]. Mobile health applications [28], shared medical appointments [29], telephone peer coaching [27], and regular general practitioner contact [30] have proven to be successful strategies for ensuring a smooth connection to care. Furthermore, providing training in communication skills and self-care education to health providers, along with reduced workload and increased availability of competent diabetes specialist nurses, has contributed to enhancing the linkage to care [31]. Educational group programs, decision support tools, and feedback reports for primary care professionals further reinforced the process [32]. Institution-level continuity of ambulatory care [33], standardized "self-care" programs [22], and patient-held health records [34] have also played pivotal roles in promoting seamless linkage to essential health care services among patients diagnosed with hypertension and diabetes.

Treatment

Various interventions have been explored to improve the treatment process for patients with hypertension and diabetes. Lifestyle interventions, including physical activity promotion and heart-healthy diets, have shown promise in improving treatment outcomes [35]. Collaborative care models involving pharmacists and physicians demonstrated positive effects on medication therapy management and overall patient care [36]. Self-monitoring of blood pressure is vital for facilitating appropriate treatment [37]. Additionally, interventions targeting medication affordability [38] and continuity of care [39-41,134] play crucial roles in ensuring optimal treatment adherence. Telehealth and digital interventions, such as continuous remote care and mobile health applications, are being explored for improved treatment accessibility and engagement [28,135]. Integrated care models, employing multidisciplinary teams and decision support tools, have yielded promising outcomes in coordinating comprehensive patient care [20,136]. Targeted education for patients and health care providers can effectively enhance communication and self-care skills [31,32]. Moreover, financial incentive programs, like pay-for-performance schemes, have encouraged optimal health care delivery and reimbursement [42].

Medication Adherence

A range of interventions has been investigated to optimize medication adherence in patients with hypertension and diabetes. Community-based interventions with patient education, recall services, and reduced out-of-pocket payments have shown promise in promoting adherence [43]. Self-measured blood pressure monitoring and chronic disease management programs

in primary care settings facilitated continuous and comprehensive patient care [38,44]. Telephone peer coaching [27], regular general practitioner contact [30], and continuity of care initiatives [39,40,45,46,134] have also demonstrated positive effects on medication adherence. Collaborative care models, which involve patient-centered coordinated care, referral systems, and diabetes education, have yielded favorable results [47]. Additionally, interventions, such as medication co-payment schemes, enhanced counseling, and training for health care providers in communication skills, have reinforced medication adherence efforts [31,48]. Patient and provider engagement programs, along with pay-for-performance initiatives, have also incentivized optimal medication adherence [32,42]. Integrating pharmacists into multidisciplinary care teams has enhanced medication management and adherence [136].

Control

Interventions, including multidisciplinary collaboration, patient education, and technology integration, were adopted to enhance hypertension and diabetes control. The integration of pharmacists into care teams and the transition to specialized diabetes physicians can optimize disease management [49,50,136]. For instance, pharmacist-physician collaborative practice models have shown promise through features like shared medical records, defined interprofessional roles, frequent follow-ups, and collaborative practice agreements [50]. Structured educational programs, both for patients and primary care professionals, offer essential knowledge and support, such as tailored SMS text message communication and telephone peer coaching [27,51]. Patient health records and electronic decision support were used to improve the continuity of care and enable tailored interventions [34]. Additionally, integrated interventions like the EMPOWER-PAR program, grounded in the Chronic Care Model, made contributions to advancing disease control, even in the face of challenges related to health care system constraints [137].

Barriers and Facilitators of Completing Different Stages of the Care Cascade

In the completion of the hypertension and diabetes care cascade, several barriers and facilitators were identified, encompassing patient-level and system-level factors (Table 3). Patient-level barriers included factors like low socioeconomic status, unhealthy lifestyle choices, and limited health literacy, hindering effective management. Misconceptions about disease and treatment, high treatment costs, and fear of diagnosis also impeded the care progress. At the system level, inadequate resources, heavy workloads, limited capacity in primary care, and a fragmented health system were identified as significant obstacles to effective care.

Table 3. Patient-level and system-level barriers and facilitators of completing different stages of the care cascade in both high-income countries and low- and middle-income countries.

Stage and country type	Facilitators	Barriers
Awareness		
HICs[a]	• Patient-level: Young age [20,52,132], female sex [52,53], and high socioeconomic status [54,132]	• Patient-level: Male sex [55], low income [55,56], poor health literacy [57], minority group [58], and living in resource-limited areas [55]
LMICs[b]	• Patient-level: Aged [53,59], female sex [10,16,59,138], high socioeconomic status [10,16,60], overweight and obesity [59-61], unhealthy lifestyle [59,60], and multimorbidity [61]	• Patient-level: Male sex [60], never married [10,60], Hispanic adults [58], and Asian adults [58]
Screening		
HICs	• Patient-level: Female sex [62-64], unemployed [61], and single [61]	• Patient-level: Low socioeconomic group [15], multimorbidity [65], and minority group [62]
LMICs	• Patient-level: Under the age of 25 years [66] and high socioeconomic group [53,60]; Use of antenatal care services [67]	• Patient-level: Low socioeconomic group [16,56], unhealthy lifestyle [66,139], and multimorbidity [65]; Not feeling at risk of hypertension [67]; Not aware of screening services [67]; Low ability to pay for health care [67]; Preference for traditional healers [67]; Perceiving hypertension as a normalized condition [67]
Diagnosis		
HICs	• Patient-level: High socioeconomic group [56]	• Patient-level: Male sex [68,132], living alone [132], multimorbidity [69], unhealthy lifestyle [132], and living in resource-limited areas [70]
LMICs	• Patient-level: Aged [60,66,71-73], overweight or obesity [63,66,71,74], and presence of other comorbidities [71]	• Patient-level: Characteristics of individuals: male sex [64,69,73], low socioeconomic group [72,75], and unhealthy lifestyle [63]; Lack of understanding regarding the importance of following a referral after a positive screening result [76]; Unaffordable health care services [67]; Fear of diagnosis, refusal to accept illness, and noncompliance with referrals [67]; Influence of culture and values, including gender norms [69]; Conflicting time with health facility opening hours [69] • System-level: Shortage of physicians [75]; Shortage of health facilities [69,76]; Lack of diagnostic equipment and testing capabilities [26,76]
Linkage to care		
HICs	• Patient-level: High socioeconomic status [77] and female sex [77]; Regular clinic visit (due to smoke) [65]; Involvement in other health programs [77] • System-level: Presence of a national or local chronic disease management program [78]	• Patient-level: Male sex [16,68,77], no health insurance [79], and low education level [64,134]; Presence of other diseases that affect physical activity [134]; Language barriers [31] • System-level: Heavy workload affecting patient care [31,77]; Inadequate collaboration among health care team members [31]; Providers' frustration and aggressive attitudes toward patients [31]
LMICs	• Patient-level: High awareness [80,81]; Social support or involvement of patients' relatives [81-83]; Context-specific diabetes education and educational materials [84]	• Patient-level: Without health insurance [80]; Misconceptions about medications [85]; Cultural beliefs [85] • System-level: Absence of guidelines for hypertension and diabetes management [38,44]; Insufficient essential resources and infrastructure [84]
Treatment		

Stage and country type	Facilitators	Barriers
HICs	- Patient-level: Young age [20,26,52,72], female sex [10,52,62], White ethnicity [52], and high health literacy [80]; Medicare beneficiary [20] - System-level: Presence of a chronic disease management program [44,78]; Home delivery of medication [86]; Good doctor-patient relationship [87,140]	- Patient-level: Male sex [68,80], no medical insurance [20,80], low education level [80], unhealthy lifestyle [88], multimorbidity [10,65,80], and language barriers [31]; Psychological fear of treatment [140] - System-level: Health care mistreatment attributed to ethnic discrimination [89]; Heavy workload of health providers [34,90,140]; Lack of collaborative strategies among health care teams [140]
LMICs	- Patient-level: High education [55,73], high income [16,55,56,60], and overweight and obesity [59,60,91]; Well-designed education and educational materials [84] - System-level: Physician density [75]; Doctors' interpersonal behaviors and technical competence [92]; Well-trained health workforce [84]	- Patient-level: Individual characteristics: never married [60], occupation [66], poor socioeconomic status [15,66,83], poor comprehension [83], unhealthy lifestyle [66], and living in resource-limited areas [16,53,55,64,70]; Misconceptions, lack of confidence, and fear about medications [85,141]; High treatment costs and low ability to pay for medication or transport [26,67]; Poor understanding of asymptomatic conditions requiring treatment [67]; Low risk awareness of non-treatment consequences [67]; Wrong understanding of the disease and its therapy [93]; Lack of social support from peers, family, and the community [93]; High time cost of seeking care [93] - System-level: Poor monitoring and lack of a patient follow-up protocol [69,94]; Ineffective medication and physician inertia [69,94]; Ambiguous and inappropriate clinical guidelines in under-resourced areas [93]; Shortage of human resources and equipment for blood pressure monitoring [93]; Limited knowledge and understanding among health care workers [76]; Lack of essential clinical facilities and adequate training of health care workers [76,84]; Absence of organized diabetes services within health care facilities [83]; Rarely receiving feedback on patient management from higher-level facilities [83]

Medication adherence

Stage and country type	Facilitators	Barriers
HICs	- Patient-level: Female sex [80,95], high income [56,95], and high level of hypertension and diabetes knowledge [95,96]; Less negative general beliefs about medications and few concerns about medications [95]	- Patient-level: Lower socioeconomic group [95]; Not confident about community pharmacists [141]; Fear about medications [85]; Cultural beliefs influencing management [31]; Multimorbidity [80]; Lack of knowledge leading to misconceptions about disease management [141] - System-level: Low primary care visits [80]; Ethnic discrimination in health care settings [89]; Heavy workload [31,90]; Lack of a teamwork approach [31]; Insufficient availability of essential medicines [38]; Ambiguous and inappropriate clinical guidelines [93]
LMICs	- Patient-level: Living in urban areas [16,45,53]	- Patient-level: High cost of medication [69]; Personal and cultural beliefs [69]; Wrong understanding of a disease and its therapy among patients [93]; Lack of support from peers, family, providers, and the community [93]

Control

Stage and country type	Facilitators	Barriers
HICs	• Patient-level: Young age [52], female sex [95], high income [74], and being of White ethnicity [52,58]; High level of hypertension and diabetes knowledge [95]; Partner involvement in care [82]; Better self-perceived health status [95]; Healthy lifestyle practices: regular exercise and weight management [97] • System-level: Trust between physicians and patients [98]	• Patient-level: Characteristics of individuals: male sex [56], ethnic minority [20], and low health literacy [96]; Lack of access to medical care and medications [50]; Using nonoptimal doses of antihypertensive medications [65]; Experiencing adverse events associated with medications [65]
LMICs	• Patient-level: High income [15,54,60,74], older age [19,72], marriage [10,54], fewer complications [65], and health insurance [19,39]; Healthy lifestyle: adopting dietary modifications or engaging in regular exercise [54,99]; Receiving long prescribed medications for hypertension and diabetes [71]; Belief in treatment efficacy and having family support [67]; Timely monitoring of blood pressure and blood glucose [19] • System-level: Adequate medications [84]; High physician density [75]	• Patient-level: Age ≥75 years [74], male sex [15,55,59,68,100], overweight [59,66,100], low income [55,60,67], specific occupations [66], and low education level [55,68]; Coexisting chronic conditions [68,97]; Living in rural or resource-limited areas [55,60]; Unhealthy lifestyle: smoking and alcohol consumption [66,97,100]; Lack of family/social support [57]; Limited awareness of the lifelong nature of the condition [67]; Complexity of the intervention [68]; Insufficient patient education about the importance of clinical management [67]; Poor communication of treatment monitoring results [67] • System-level: Long waiting times at clinics [67]; Negative staff attitudes toward patients [67]; Weak monitoring schedules [67]; Lack of medical resources [84]

aHIC: high-income country.

bLMIC: low- and middle-income country.

Conversely, various patient-level facilitators positively impacted the cascade. At the patient level, characteristics like high socioeconomic status, positive health behaviors, and strong belief in treatment efficacy played vital roles. Furthermore, timely monitoring of blood pressure and glucose levels, engagement in health programs, and partner involvement were found to be associated with improved outcomes. System-level facilitators included a well-trained health workforce, existing chronic disease management programs, and improved access to medications.

Notably, certain barriers and facilitators were context-specific, with diverse prominence in HICs and LMICs. For instance, lack of understanding and misconceptions were more prevalent in LMICs, while the influence of cultural beliefs and minority status was more pronounced in HICs. Physician density and adequate resources were often noted as facilitators in HICs, while social support and tailored diabetes education were emphasized in LMICs.

Discussion

This scoping review identified a substantial body of literature investigating the hypertension and diabetes care cascade in both HICs and LMICs. While most studies provided descriptive snapshots of each cascade stage, only a limited number of studies applied implementation cascade analysis to explore the barriers and facilitators of patient retention. Furthermore, there was a paucity of studies evaluating the effects of interventions to bridge gaps between cascade stages. In addition to analyzing the characteristics of the included studies, this scoping review comprehensively summarized key interventions, facilitators, and barriers associated with completing cascade stages. These findings provide critical insights into the existing evidence on hypertension and diabetes management, offering valuable directions for enhancing health care delivery for these chronic conditions.

The results of this scoping review have revealed a notable gap in the existing literature concerning the entire continuum of all stages in the hypertension and diabetes care cascade. The majority of studies predominantly focused on treatment and control for both hypertension and diabetes care. There was a relative paucity of studies examining the stages before treatment initiation despite evidence suggesting that over 50% of patients with hypertension and diabetes who could benefit from treatment never start medication [3,72]. These pretreatment losses accounted for a much greater reduction in effective care than nonadherence to medication [101]. Modeling studies showed that treatment losses earlier on can result in a greater overall reduction in the public health benefit of hypertension management [142,143]. Potential gaps exist in identifying problems and developing strategies to improve awareness, screening, and diagnosis of the 2 diseases. Based on microsimulation modeling, it is estimated that scaling up diagnosis, treatment, and control of diabetes to achieve a hypothetical 80% target for each component of the care cascade would be highly cost-effective [143,144]. Regarding interventions to improve retention across cascade stages, the review emphasizes the importance of awareness campaigns and health education programs to improve patient retention in care and medication adherence. Moreover, interventions targeting the health system (ie, multidiscipline collaborative care, training for primary health care providers, and increasing access to medications) showed promise in improving diagnosis and treatment outcomes. Other innovations in hypertension and diabetes service delivery have been developed and could further enhance quality, but they require further study and proof of effectiveness at scale. Examples include electronic case record–based clinical decision support systems and telephone

peer coaching [27,32]. There was a relative dearth of studies incorporating informatics, internet techniques, and mass media to capture public opinions and enhance patient engagement in the management of these conditions. These technologies and communication strategies have only recently gained prominence, and their full potential in the context of hypertension and diabetes care has not yet been comprehensively explored. Our findings parallel another review about the implementation of telemedicine interventions for hypertension and diabetes, indicating that successful implementation of these interventions necessitates comprehensive efforts at all stages of planning, execution, engagement, and reflection and evaluation [145]. The adaptation of interventions to diverse contexts, particularly in LMICs with fragile health systems, warrants future studies. Implementation studies are essential to develop context-specific strategies for incorporating evidence-based interventions effectively into practice [146].

The review also revealed several facilitators and barriers affecting different stages of the care cascade across different income contexts. These insights are of paramount importance, serving as a compass for forthcoming investigations. Future studies can harness these nuanced factors to craft precise context-specific strategies that seamlessly integrate evidence-based interventions into clinical practice. Tailored interventions that address specific patient characteristics, cultural beliefs, and health system constraints are pivotal to enhancing care delivery. The implementation of evidence-based strategies, coupled with the cultivation of patient-centered care, paves the way for health care systems to embark on a journey toward equitable and ameliorated outcomes in hypertension and diabetes management, thereby catering to the unique needs of diverse patient populations.

This review highlights that the provision of integrated care for individuals with both hypertension and diabetes within primary care settings has the potential to be a judicious and efficient approach. The rationale behind this integration lies in the substantial overlap between the risk factors and management pathways of these 2 prevalent chronic conditions. This shared etiological foundation emphasizes the importance of addressing common risk factors, such as dietary patterns, physical activity levels, smoking habits, and weight management, concurrently. By focusing on integrated interventions that aim to modify these shared risk factors, primary care providers can foster holistic and synergistic management. Moreover, primary care providers play a pivotal role in early diagnosis, timely initiation of treatment, and regular follow-up. This proactive approach is essential for mitigating the burden of hypertension and diabetes, as well as their associated complications.

Our study has several strengths. We identified studies from a wide range of geographic and care delivery settings. In addition, this review expands upon the evidence regarding interventions throughout the hypertension and diabetes care cascade, offering insights into diverse strategies to address each stage. By encompassing studies conducted in both HICs and LMICs, this review captures the global perspective on interventions for hypertension and diabetes care. This strengthens the generalizability of the findings and provides insights into the varying challenges and approaches across different health care settings. While this scoping review offers valuable insights into the extensive body of literature concerning the hypertension and diabetes care cascade, it is important to recognize the inherent limitations of this approach compared to systematic reviews and meta-analyses. This breadth of mapping key concepts across diverse domains and disciplines might come at the cost of depth. The interventions described in our review predominantly featured descriptive accounts in the included reports, with the absence of a quantitative assessment of intervention effects, which is important for informing designs in other settings but does not allow for inferences about their effectiveness. As is typical with scoping reviews, we did not assess the quality of the included articles. This inherent limitation underscores the need for further research, particularly systematic reviews and meta-analyses, to delve deeper into the efficacy of interventions across various stages of the hypertension and diabetes care cascade. Moreover, the focus of this review was on studies that explicitly applied the cascade care lens to one or more stages of hypertension and diabetes care, which may have inadvertently excluded studies that explored these critical stages without using the term "cascade" or its associated lexicon. While this search strategy enabled a more targeted examination of research aligned with the cascade model, it also introduced an inadvertent restriction, potentially omitting relevant investigations that did not employ the cascade framework explicitly. This limitation underscores the need for future studies to explore these care stages more comprehensively, even when the cascade terminology is not explicitly invoked, providing a more holistic view of hypertension and diabetes care. Despite this limitation, our scoping review offers valuable insights into a broad landscape of influencing factors and interventions across the care cascade.

In conclusion, this scoping review offers valuable insights into the evidence of the hypertension and diabetes care cascade, highlighting the importance of comprehensive interventions that address all stages of disease management. By identifying facilitators and barriers, the study emphasizes the need for tailored health care strategies to improve patient outcomes. Moving forward, integrating collaborative care models, tailored education programs, and health care system enhancements can potentially enhance disease control and improve the quality of life for individuals living with hypertension and diabetes. These findings have significant implications for clinical practice and health policy, serving as a foundation for future research and efforts to optimize the care cascade for chronic disease management.

Data Availability

The data sets generated during or analyzed during this study are available from the corresponding author on reasonable request.

Authors' Contributions

XY and RS conceived and designed the study. XY developed the search strategy. JW and FT ran the search. JW, FT, ZW, YY, and XY conducted the study selection processes (title and abstract screening followed by full-text screening). JW, FT, ZW, and YY extracted the data. XY verified the data extraction. JW, FT, and XY analyzed and interpreted the data. JW wrote the first draft of the manuscript with XY. All authors contributed to the writing of the manuscript. All authors critically revised the manuscript and approved the final version.

Conflicts of Interest

None declared.

Multimedia Appendix 1

Search strategy.
[DOCX File , 15 KB-Multimedia Appendix 1]

Multimedia Appendix 2

Details of the included studies.
[DOCX File , 54 KB-Multimedia Appendix 2]

Multimedia Appendix 3

PRISMA-ScR (Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews) checklist.
[DOCX File , 71 KB-Multimedia Appendix 3]

References

1. NCD Countdown 2030 collaborators. NCD Countdown 2030: worldwide trends in non-communicable disease mortality and progress towards Sustainable Development Goal target 3.4. Lancet. Sep 22, 2018;392(10152):1072-1088. [FREE Full text] [doi: 10.1016/S0140-6736(18)31992-5] [Medline: 30264707]
2. Gupta R, Xavier D. Hypertension: The most important non communicable disease risk factor in India. Indian Heart J. 2018;70(4):565-572. [FREE Full text] [doi: 10.1016/j.ihj.2018.02.003] [Medline: 30170654]
3. NCD Risk Factor Collaboration (NCD-RisC). Worldwide trends in hypertension prevalence and progress in treatment and control from 1990 to 2019: a pooled analysis of 1201 population-representative studies with 104 million participants. Lancet. Sep 11, 2021;398(10304):957-980. [FREE Full text] [doi: 10.1016/S0140-6736(21)01330-1] [Medline: 34450083]
4. Wang L, Peng W, Zhao Z, Zhang M, Shi Z, Song Z, et al. Prevalence and Treatment of Diabetes in China, 2013-2018. JAMA. Dec 28, 2021;326(24):2498-2506. [FREE Full text] [doi: 10.1001/jama.2021.22208] [Medline: 34962526]
5. Ogurtsova K, Guariguata L, Barengo NC, Ruiz PL, Sacre JW, Karuranga S, et al. IDF diabetes Atlas: Global estimates of undiagnosed diabetes in adults for 2021. Diabetes Res Clin Pract. Jan 2022;183:109118. [doi: 10.1016/j.diabres.2021.109118] [Medline: 34883189]
6. Subbaraman R, Nathavitharana RR, Mayer KH, Satyanarayana S, Chadha VK, Arinaminpathy N, et al. Constructing care cascades for active tuberculosis: A strategy for program monitoring and identifying gaps in quality of care. PLoS Med. Feb 27, 2019;16(2):e1002754. [FREE Full text] [doi: 10.1371/journal.pmed.1002754] [Medline: 30811385]
7. Muiruri C, Manavalan P, Jazowski SA, Knettel BA, Vilme H, Zullig LL. Opportunities to Leverage Telehealth Approaches Along the Hypertension Control Cascade in Sub-Saharan Africa. Curr Hypertens Rep. Aug 26, 2019;21(10):75. [FREE Full text] [doi: 10.1007/s11906-019-0983-2] [Medline: 31451940]
8. Gardner EM, McLees MP, Steiner JF, Del Rio C, Burman WJ. The spectrum of engagement in HIV care and its relevance to test-and-treat strategies for prevention of HIV infection. Clin Infect Dis. Mar 15, 2011;52(6):793-800. [FREE Full text] [doi: 10.1093/cid/ciq243] [Medline: 21367734]
9. Polaris Observatory HCV Collaborators. Global change in hepatitis C virus prevalence and cascade of care between 2015 and 2020: a modelling study. Lancet Gastroenterol Hepatol. May 2022;7(5):396-415. [doi: 10.1016/S2468-1253(21)00472-6] [Medline: 35180382]
10. Zhao Y, Anindya K, Atun R, Marthias T, Han C, McPake B, et al. Provincial heterogeneity in the management of care cascade for hypertension, diabetes, and dyslipidaemia in China: Analysis of nationally representative population-based survey. Front Cardiovasc Med. 2022;9:923249. [FREE Full text] [doi: 10.3389/fcvm.2022.923249] [Medline: 36093142]
11. Arksey H, O'Malley L. Scoping studies: towards a methodological framework. International Journal of Social Research Methodology. Feb 2005;8(1):19-32. [doi: 10.1080/1364557032000119616]

12. Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. Ann Intern Med. Oct 02, 2018;169(7):467-473. [FREE Full text] [doi: 10.7326/M18-0850] [Medline: 30178033]

13. Peters M, Godfrey C, Mcinerney P, Soares C, Khalil H, Parker D. In: Aromataris E, editor. Methodology for JBI Scoping Reviews: The Joanna Briggs Institute Reviewers' Manual. South Australia. Joanna Briggs Institute; 2015;3-24.

14. World Bank Country and Lending Groups. The World Bank. URL: https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups [accessed 2024-01-11]

15. Chham S, Buffel V, Van Olmen J, Chhim S, Ir P, Wouters E. The cascade of hypertension care in Cambodia: evidence from a cross-sectional population-based survey. BMC Health Serv Res. Jun 29, 2022;22(1):838. [FREE Full text] [doi: 10.1186/s12913-022-08232-7] [Medline: 35768805]

16. Geldsetzer P, De Neve J, Mohan V, Prabhakaran D, Roy A, Tandon N, et al. Health System Performance for Multimorbid Cardiometabolic Disease in India: A Population-Based Cross-Sectional Study. Glob Heart. 2022;17(1):7. [FREE Full text] [doi: 10.5334/gh.1056] [Medline: 35174048]

17. Byun DH, Chang RS, Park M, Son H, Kim C. Prioritizing Community-Based Intervention Programs for Improving Treatment Compliance of Patients with Chronic Diseases: Applying an Analytic Hierarchy Process. Int J Environ Res Public Health. Jan 08, 2021;18(2):455. [FREE Full text] [doi: 10.3390/ijerph18020455] [Medline: 33430108]

18. Kargar Jahromi M, Ramezanli S, Taheri L. Effectiveness of diabetes self-management education on quality of life in diabetic elderly females. Glob J Health Sci. Jul 29, 2014;7(1):10-15. [FREE Full text] [doi: 10.5539/gjhs.v7n1p10] [Medline: 25560339]

19. Wang H, Wang W, Fan L. The impact of continuous nursing intervention on T2DM patients' prognoses and quality of life. Int J Clin Exp Med. 2020;13(12):9495-9505. [FREE Full text]

20. Wozniak G, Khan T, Gillespie C, Sifuentes L, Hasan O, Ritchey M, et al. Hypertension Control Cascade: A Framework to Improve Hypertension Awareness, Treatment, and Control. J Clin Hypertens (Greenwich). Mar 2016;18(3):232-239. [FREE Full text] [doi: 10.1111/jch.12654] [Medline: 26337797]

21. Xu DR, Dev R, Shrestha A, Zhang L, Shrestha A, Shakya P, et al. NUrse-led COntinuum of care for people with Diabetes and prediabetes (NUCOD) in Nepal: study protocol for a cluster randomized controlled trial. Trials. May 29, 2020;21(1):442. [FREE Full text] [doi: 10.1186/s13063-020-04372-5] [Medline: 32471476]

22. Lee J, Smith JP. The effect of health promotion on diagnosis and management of diabetes. J Epidemiol Community Health. Apr 2012;66(4):366-371. [FREE Full text] [doi: 10.1136/jech.2009.087304] [Medline: 21282142]

23. Heller DJ, Balzer LB, Kazi D, Charlebois ED, Kwarisiima D, Mwangwa F, et al. Hypertension testing and treatment in Uganda and Kenya through the SEARCH study: An implementation fidelity and outcome evaluation. PLoS One. 2020;15(1):e0222801. [FREE Full text] [doi: 10.1371/journal.pone.0222801] [Medline: 31940346]

24. Sudharsanan N, Chen S, Garber M, Bärnighausen T, Geldsetzer P. The Effect Of Home-Based Hypertension Screening On Blood Pressure Change Over Time In South Africa. Health Aff (Millwood). Jan 2020;39(1):124-132. [doi: 10.1377/hlthaff.2019.00585] [Medline: 31905068]

25. Patel SA, Sharma H, Mohan S, Weber MB, Jindal D, Jarhyan P, et al. The Integrated Tracking, Referral, and Electronic Decision Support, and Care Coordination (I-TREC) program: scalable strategies for the management of hypertension and diabetes within the government healthcare system of India. BMC Health Serv Res. Nov 09, 2020;20(1):1022. [FREE Full text] [doi: 10.1186/s12913-020-05851-w] [Medline: 33168004]

26. Gabert R, Ng M, Sogarwal R, Bryant M, Deepu RV, McNellan CR, et al. Identifying gaps in the continuum of care for hypertension and diabetes in two Indian communities. BMC Health Serv Res. Dec 27, 2017;17(1):846. [FREE Full text] [doi: 10.1186/s12913-017-2796-9] [Medline: 29282052]

27. McGowan P, Lynch S, Hensen F. The Role and Effectiveness of Telephone Peer Coaching for Adult Patients With Type 2 Diabetes. Can J Diabetes. Aug 2019;43(6):399-405. [doi: 10.1016/j.jcjd.2019.03.006] [Medline: 31080092]

28. Wang Y, Li M, Zhao X, Pan X, Lu M, Lu J, et al. Effects of continuous care for patients with type 2 diabetes using mobile health application: A randomised controlled trial. Int J Health Plann Manage. Jul 31, 2019;34(3):1025-1035. [doi: 10.1002/hpm.2872] [Medline: 31368137]

29. Heisler M, Burgess J, Cass J, Chardos JF, Guirguis AB, Strohecker LA, et al. Evaluating the Effectiveness of Diabetes Shared Medical Appointments (SMAs) as Implemented in Five Veterans Affairs Health Systems: a Multi-site Cluster Randomized Pragmatic Trial. J Gen Intern Med. Jun 2021;36(6):1648-1655. [doi: 10.1007/s11606-020-06570-y] [Medline: 33532956]

30. Youens D, Robinson S, Doust J, Harris MN, Moorin R. Associations between regular GP contact, diabetes monitoring and glucose control: an observational study using general practice data. BMJ Open. Nov 10, 2021;11(11):e051796. [FREE Full text] [doi: 10.1136/bmjopen-2021-051796] [Medline: 34758997]

31. Noor Abdulhadi NM, Al-Shafaee MA, Wahlström R, Hjelm K. Doctors' and nurses' views on patient care for type 2 diabetes: an interview study in primary health care in Oman. Prim Health Care Res Dev. Jul 2013;14(3):258-269. [FREE Full text] [doi: 10.1017/S146342361200062X] [Medline: 23259934]

32. Ramallo-Fariña Y, García-Pérez L, Castilla-Rodríguez I, Perestelo-Pérez L, Wägner A, de Pablos-Velasco P, Salinero-Fort; et al. INDICA team. Effectiveness and cost-effectiveness of knowledge transfer and behavior modification interventions

in type 2 diabetes mellitus patients--the INDICA study: a cluster randomized controlled trial. Implement Sci. Apr 09, 2015;10:47. [FREE Full text] [doi: 10.1186/s13012-015-0233-1] [Medline: 25880498]

33. Hong J, Kang H. Relationship between continuity of ambulatory care and medication adherence in adult patients with type 2 diabetes in Korea: a longitudinal analysis. Med Care. May 2014;52(5):446-453. [doi: 10.1097/MLR.0000000000000110] [Medline: 24714582]

34. Joseph L, Greenfield S, Lavis A, Lekha TR, Panniyammakal J, Manaseki-Holland S. Exploring Factors Affecting Health Care Providers' Behaviors for Maintaining Continuity of Care in Kerala, India; A Qualitative Analysis Using the Theoretical Domains Framework. Front Public Health. 2022;10:891103. [FREE Full text] [doi: 10.3389/fpubh.2022.891103] [Medline: 35875019]

35. Shamsi SA, Salehzadeh M, Ghavami H, Asl RG, Vatani KK. Impact of lifestyle interventions on reducing dietary sodium intake and blood pressure in patients with hypertension: A randomized controlled trial. Turk Kardiyol Dern Ars. Mar 2021;49(2):143-150. [FREE Full text] [doi: 10.5543/tkda.2021.81669] [Medline: 33709920]

36. Hirsch JD, Steers N, Adler DS, Kuo GM, Morello CM, Lang M, et al. Primary care-based, pharmacist-physician collaborative medication-therapy management of hypertension: a randomized, pragmatic trial. Clin Ther. Sep 01, 2014;36(9):1244-1254. [FREE Full text] [doi: 10.1016/j.clinthera.2014.06.030] [Medline: 25085406]

37. Roy D, Meador M, Sasu N, Whelihan K, Lewis JH. Are Community Health Center Patients Interested in Self-Measured Blood Pressure Monitoring (SMBP) – And Can They Do It? IBPC. Feb 2021;Volume 14:19-29. [doi: 10.2147/ibpc.s285007]

38. Bay N, Juga E, Macuacua C, João J, Costa M, Stewart S, et al. Assessment of care provision for hypertension at the emergency Department of an Urban Hospital in Mozambique. BMC Health Serv Res. Dec 18, 2019;19(1):975. [FREE Full text] [doi: 10.1186/s12913-019-4820-8] [Medline: 31852481]

39. Barrera L, Oviedo D, Silva A, Tovar D, Méndez F. Continuity of Care and the Control of High Blood Pressure at Colombian Primary Care Services. Inquiry. 2021;58:469580211047043. [FREE Full text] [doi: 10.1177/00469580211047043] [Medline: 34620003]

40. Choi D, Choi S, Kim H, Kim K, Kim N, Ko A, et al. Impact of continuity of care on cardiovascular disease risk among newly-diagnosed hypertension patients. Sci Rep. Nov 17, 2020;10(1):19991. [FREE Full text] [doi: 10.1038/s41598-020-77131-w] [Medline: 33203931]

41. Chalermsri C, Paisansudhi S, Kantachuvesiri P, Pramyothin P, Washirasaksiri C, Srivanichakorn W, et al. The effectiveness of holistic diabetic management between Siriraj Continuity of Care clinic and medical out-patient department. J Med Assoc Thai. Mar 2014;97 Suppl 3:S197-S205. [Medline: 24772599]

42. Chen C, Cheng S. Does pay-for-performance benefit patients with multiple chronic conditions? Evidence from a universal coverage health care system. Health Policy Plan. Feb 2016;31(1):83-90. [doi: 10.1093/heapol/czv024] [Medline: 25944704]

43. Son K, Son H, Park B, Kim H, Kim C. A Community-Based Intervention for Improving Medication Adherence for Elderly Patients with Hypertension in Korea. Int J Environ Res Public Health. Feb 28, 2019;16(5):721. [FREE Full text] [doi: 10.3390/ijerph16050721] [Medline: 30823383]

44. Lee W, Yoo K, Jeong J, Koo JH. Chronic Disease Management for People With Hypertension. Int J Public Health. 2022;67:1604452. [FREE Full text] [doi: 10.3389/ijph.2022.1604452] [Medline: 35719730]

45. Chen C, Cheng S. Continuity of care and changes in medication adherence among patients with newly diagnosed diabetes. Am J Manag Care. Feb 2016;22(2):136-142. [FREE Full text] [Medline: 26885673]

46. Chen C, Tseng C, Cheng S. Continuity of care, medication adherence, and health care outcomes among patients with newly diagnosed type 2 diabetes: a longitudinal analysis. Med Care. Mar 2013;51(3):231-237. [doi: 10.1097/MLR.0b013e31827da5b9] [Medline: 23269110]

47. Desse TA, Namara KM, Yifter H, Manias E. Development of a Complex Intervention for Effective Management of Type 2 Diabetes in a Developing Country. J Clin Med. Feb 22, 2022;11(5):1149. [FREE Full text] [doi: 10.3390/jcm11051149] [Medline: 35268240]

48. Stuart RM, Khan O, Abeysuriya R, Kryvchun T, Lysak V, Bredikhina A, et al. Diabetes care cascade in Ukraine: an analysis of breakpoints and opportunities for improved diabetes outcomes. BMC Health Serv Res. May 11, 2020;20(1):409. [FREE Full text] [doi: 10.1186/s12913-020-05261-y] [Medline: 32393341]

49. Halalau A, Sonmez M, Uddin A, Karabon P, Scherzer Z, Keeney S. Efficacy of a pharmacist-managed diabetes clinic in high-risk diabetes patients, a randomized controlled trial - "Pharm-MD" : Impact of clinical pharmacists in diabetes care. BMC Endocr Disord. Mar 16, 2022;22(1):69. [FREE Full text] [doi: 10.1186/s12902-022-00983-y] [Medline: 35296307]

50. Sisson EM, Dixon DL, Kildow DC, Van Tassell BW, Carl DE, Varghese D, et al. Effectiveness of a Pharmacist-Physician Team-Based Collaboration to Improve Long-Term Blood Pressure Control at an Inner-City Safety-Net Clinic. Pharmacotherapy. Mar 2016;36(3):342-347. [doi: 10.1002/phar.1710] [Medline: 26917116]

51. Gomes LC, Coelho ACM, Gomides DDS, Foss-Freitas MC, Foss MC, Pace AE. Contribution of family social support to the metabolic control of people with diabetes mellitus: A randomized controlled clinical trial. Appl Nurs Res. Aug 2017;36:68-76. [doi: 10.1016/j.apnr.2017.05.009] [Medline: 28720242]

52. Foti K, Wang D, Appel LJ, Selvin E. Hypertension Awareness, Treatment, and Control in US Adults: Trends in the Hypertension Control Cascade by Population Subgroup (National Health and Nutrition Examination Survey, 1999-2016). Am J Epidemiol. Dec 31, 2019;188(12):2165-2174. [FREE Full text] [doi: 10.1093/aje/kwz177] [Medline: 31504121]

53. Amarchand R, Kulothungan V, Krishnan A, Mathur P. Hypertension treatment cascade in India: results from National Noncommunicable Disease Monitoring Survey. J Hum Hypertens. May 2023;37(5):394-404. [FREE Full text] [doi: 10.1038/s41371-022-00692-y] [Medline: 35513442]

54. Chen H, Su B. Factors Related to the Continuity of Care and Self-Management of Patients with Type 2 Diabetes Mellitus: A Cross-Sectional Study in Taiwan. Healthcare (Basel). Oct 20, 2022;10(10):2088. [FREE Full text] [doi: 10.3390/healthcare10102088] [Medline: 36292535]

55. Prenissl J, Jaacks LM, Mohan V, Manne-Goehler J, Davies JI, Awasthi A, et al. Variation in health system performance for managing diabetes among states in India: a cross-sectional study of individuals aged 15 to 49 years. BMC Med. May 13, 2019;17(1):92. [FREE Full text] [doi: 10.1186/s12916-019-1325-6] [Medline: 31084606]

56. Passi-Solar Á, Margozzini P, Mindell JS, Ruiz M, Valencia-Hernandez CA, Scholes S. Hypertension care cascade in Chile: a serial cross-sectional study of national health surveys 2003-2010-2017. BMC Public Health. Sep 14, 2020;20(1):1397. [FREE Full text] [doi: 10.1186/s12889-020-09483-x] [Medline: 32928176]

57. Dedefo MG, Abate SK, Ejeta BM, Korsa AT. Predictors of poor glycemic control and level of glycemic control among diabetic patients in west Ethiopia. Ann Med Surg (Lond). Jul 2020;55:238-243. [FREE Full text] [doi: 10.1016/j.amsu.2020.04.034] [Medline: 32528672]

58. Aggarwal R, Chiu N, Wadhera RK, Moran AE, Raber I, Shen C, et al. Racial/Ethnic Disparities in Hypertension Prevalence, Awareness, Treatment, and Control in the United States, 2013 to 2018. Hypertension. Dec 2021;78(6):1719-1726. [doi: 10.1161/HYPERTENSIONAHA.121.17570] [Medline: 34365809]

59. Tapela NM, Clifton L, Tshisimogo G, Gaborone M, Madidimalo T, Letsatsi V, et al. Prevalence and Determinants of Hypertension Awareness, Treatment, and Control in Botswana: A Nationally Representative Population-Based Survey. Int J Hypertens. 2020;2020:8082341. [FREE Full text] [doi: 10.1155/2020/8082341] [Medline: 32550019]

60. Dhungana RR, Pedisic Z, Dhimal M, Bista B, de Courten M. Hypertension screening, awareness, treatment, and control: a study of their prevalence and associated factors in a nationally representative sample from Nepal. Glob Health Action. Dec 31, 2022;15(1):2000092. [FREE Full text] [doi: 10.1080/16549716.2021.2000092] [Medline: 35132939]

61. Chikafu H, Chimbari M. Hypertension care cascade in the Ingwavuma rural community, uMkhanyakude District, KwaZulu-Natal province of South Africa. PeerJ. 2021;9:e12372. [FREE Full text] [doi: 10.7717/peerj.12372] [Medline: 34824908]

62. Berry KM, Parker W, Mchiza ZJ, Sewpaul R, Labadarios D, Rosen S, et al. Quantifying unmet need for hypertension care in South Africa through a care cascade: evidence from the SANHANES, 2011-2012. BMJ Glob Health. 2017;2(3):e000348. [FREE Full text] [doi: 10.1136/bmjgh-2017-000348] [Medline: 29082013]

63. Jorgensen JMA, Hedt KH, Omar OM, Davies JI. Hypertension and diabetes in Zanzibar - prevalence and access to care. BMC Public Health. Sep 04, 2020;20(1):1352. [FREE Full text] [doi: 10.1186/s12889-020-09432-8] [Medline: 32887593]

64. Odland ML, Bockarie T, Wurie H, Ansumana R, Lamin J, Nugent R, et al. Prevalence and access to care for cardiovascular risk factors in older people in Sierra Leone: a cross-sectional survey. BMJ Open. Sep 09, 2020;10(9):e038520. [FREE Full text] [doi: 10.1136/bmjopen-2020-038520] [Medline: 32907906]

65. Shah SA, Rosenberg M, Ahmad D, Ahmad S, Safian N, Shobugawa Y. Prevalence and determinants of unmet needs for hypertension care among the older population in Selangor: cross-sectional study. Health Res Policy Syst. Nov 29, 2022;20(Suppl 1):127. [FREE Full text] [doi: 10.1186/s12961-022-00915-1] [Medline: 36443790]

66. Kothavale A, Puri P, Yadav S. The burden of hypertension and unmet need for hypertension care among men aged 15-54 years: a population-based cross-sectional study in India. J Biosoc Sci. Nov 2022;54(6):1078-1099. [doi: 10.1017/S0021932021000481] [Medline: 34602120]

67. Fraser-Hurt N, Naseri LT, Thomsen R, Matalavea A, Ieremia-Faasili V, Reupena MS, et al. Improving services for chronic non-communicable diseases in Samoa: an implementation research study using the care cascade framework. Aust N Z J Public Health. Feb 2022;46(1):36-45. [FREE Full text] [doi: 10.1111/1753-6405.13113] [Medline: 34309937]

68. Macinko J, Leventhal DGP, Lima-Costa MF. Primary Care and the Hypertension Care Continuum in Brazil. J Ambul Care Manage. 2018;41(1):34-46. [doi: 10.1097/JAC.0000000000000222] [Medline: 29176460]

69. Geraedts TJM, Boateng D, Lindenbergh KC, van Delft D, Mathéron H, Mönnink G, et al. Evaluating the cascade of care for hypertension in Sierra Leone. Trop Med Int Health. Nov 2021;26(11):1470-1480. [FREE Full text] [doi: 10.1111/tmi.13664] [Medline: 34350675]

70. Price AJ, Crampin AC, Amberbir A, Kayuni-Chihana N, Musicha C, Tafatatha T, et al. Prevalence of obesity, hypertension, and diabetes, and cascade of care in sub-Saharan Africa: a cross-sectional, population-based study in rural and urban Malawi. Lancet Diabetes Endocrinol. Mar 2018;6(3):208-222. [FREE Full text] [doi: 10.1016/S2213-8587(17)30432-1] [Medline: 29371076]

71. Abu Hamad BA, Jamaluddine Z, Safadi G, Ragi M, Ahmad RES, Vamos EP, et al. The hypertension cascade of care in the midst of conflict: the case of the Gaza Strip. J Hum Hypertens. Oct 2023;37(10):957-968. [FREE Full text] [doi: 10.1038/s41371-022-00783-w] [Medline: 36509988]

72. Manne-Goehler J, Geldsetzer P, Agoudavi K, Andall-Brereton G, Aryal KK, Bicaba BW, et al. Health system performance for people with diabetes in 28 low- and middle-income countries: A cross-sectional study of nationally representative

surveys. PLoS Med. Mar 1, 2019;16(3):e1002751. [FREE Full text] [doi: 10.1371/journal.pmed.1002751] [Medline: 30822339]

73. Osetinsky B, Mhalu G, Mtenga S, Tediosi F. Care cascades for hypertension and diabetes: Cross-sectional evaluation of rural districts in Tanzania. PLoS Med. Dec 2022;19(12):e1004140. [FREE Full text] [doi: 10.1371/journal.pmed.1004140] [Medline: 36469527]

74. Zhao E, Wu Q, Crimmins E, Zhang Y. Hypertension Diagnosis, Treatment, and Control among Older Chinese: Trends in the Hypertension Care Cascade. Innov Aging. 2021;5(Suppl 1):607-608. [doi: 10.1093/geroni/igab046.2328]

75. Carrillo-Larco RM, Guzman-Vilca WC, Neupane D. Estimating the gap between demand and supply of medical appointments by physicians for hypertension care: a pooled analysis in 191 countries. BMJ Open. Apr 04, 2022;12(4):e059933. [doi: 10.1136/bmjopen-2021-059933] [Medline: 35379646]

76. Lewis CP, Newell JN. Patients' perspectives of care for type 2 diabetes in Bangladesh -a qualitative study. BMC Public Health. Jul 21, 2014;14:737. [FREE Full text] [doi: 10.1186/1471-2458-14-737] [Medline: 25047797]

77. Yen S, Kung P, Sheen Y, Chiu L, Xu X, Tsai W. Factors related to continuing care and interruption of P4P program participation in patients with diabetes. Am J Manag Care. Jan 01, 2016;22(1):e18-e30. [FREE Full text] [Medline: 26799201]

78. Mayer V, Mijanovich T, Egorova N, Flory J, Mushlin A, Calvo M, et al. Impact of New York State's Health Home program on access to care among patients with diabetes. BMJ Open Diabetes Res Care. Dec 2021;9(Suppl 1):e002204. [FREE Full text] [doi: 10.1136/bmjdrc-2021-002204] [Medline: 34933873]

79. Doubova SV, Borja-Aburto VH, Guerra-Y-Guerra G, Salgado-de-Snyder VN, González-Block M. Loss of job-related right to healthcare is associated with reduced quality and clinical outcomes of diabetic patients in Mexico. Int J Qual Health Care. May 01, 2018;30(4):283-290. [doi: 10.1093/intqhc/mzy012] [Medline: 29432612]

80. Qiu C, Chen S, Yao Y, Zhao Y, Xin Y, Zang X. Adaption and validation of Nijmegen continuity questionnaire to recognize the influencing factors of continuity of care for hypertensive patients in China. BMC Health Serv Res. Jan 29, 2019;19(1):79. [FREE Full text] [doi: 10.1186/s12913-019-3915-6] [Medline: 30696430]

81. Jalilian H, Heydari S, Mir N, Fehresti S, Khodayari-Zarnaq R. Forgone care in patients with type 2 diabetes: a cross-sectional study. BMC Public Health. Aug 24, 2021;21(1):1588. [doi: 10.1186/s12889-021-11639-2] [Medline: 34429093]

82. Soriano EC, Lenhard MJ, Gonzalez JS, Tennen H, Otto AK, Perndorfer C, et al. Momentary Partner Involvement in Diabetes Self-Care and Continuously Measured Glucose: A Dynamic Analysis. Psychosom Med. Sep 01, 2022;84(7):808-812. [FREE Full text] [doi: 10.1097/PSY.0000000000001106] [Medline: 35792706]

83. Mwangome M, Geubbels E, Klatser P, Dieleman M. Perceptions on diabetes care provision among health providers in rural Tanzania: a qualitative study. Health Policy Plan. Apr 01, 2017;32(3):418-429. [FREE Full text] [doi: 10.1093/heapol/czw143] [Medline: 27935802]

84. Desse TA, Mc Namara K, Yifter H, Manias E. Current practices and future preferences of type 2 diabetes care in Ethiopia: A qualitative study on the perspectives of patients, health professionals, and policymakers. Diabetes Metab Syndr. Aug 2022;16(8):102585. [doi: 10.1016/j.dsx.2022.102585] [Medline: 35939942]

85. Jayanna K, Swaroop N, Kar A, Ramanaik S, Pati MK, Pujar A, et al. Designing a comprehensive Non-Communicable Diseases (NCD) programme for hypertension and diabetes at primary health care level: evidence and experience from urban Karnataka, South India. BMC Public Health. Apr 16, 2019;19(1):409. [FREE Full text] [doi: 10.1186/s12889-019-6735-z] [Medline: 30991978]

86. David NJ, Bresick G, Moodaley N, Von Pressentin KB. Measuring the impact of community-based interventions on type 2 diabetes control during the COVID-19 pandemic in Cape Town - A mixed methods study. S Afr Fam Pract (2004). Aug 18, 2022;64(1):e1-e9. [FREE Full text] [doi: 10.4102/safp.v64i1.5558] [Medline: 36073102]

87. Dambha-Miller H, Silarova B, Irving G, Kinmonth AL, Griffin SJ. Patients' views on interactions with practitioners for type 2 diabetes: a longitudinal qualitative study in primary care over 10 years. Br J Gen Pract. Jan 2018;68(666):e36-e43. [FREE Full text] [doi: 10.3399/bjgp17X693917] [Medline: 29203681]

88. Kazemian P, Shebl FM, McCann N, Walensky RP, Wexler DJ. Evaluation of the Cascade of Diabetes Care in the United States, 2005-2016. JAMA Intern Med. Oct 01, 2019;179(10):1376-1385. [FREE Full text] [doi: 10.1001/jamainternmed.2019.2396] [Medline: 31403657]

89. Ortiz MS, Baeza-Rivera MJ, Salinas-Oñate N, Flynn P, Betancourt H. [Healthcare mistreatment attributed to discrimination among mapuche patients and discontinuation of diabetes care]. Rev Med Chil. Oct 2016;144(10):1270-1276. [FREE Full text] [doi: 10.4067/S0034-98872016001000006] [Medline: 28074982]

90. Kim H, Moon K, Park T, Park S, Yoon S, Oh I. Factors affecting treatment compliance in new hypertensive patients in Korea. Clin Exp Hypertens. 2016;38(8):701-709. [doi: 10.1080/10641963.2016.1200599] [Medline: 27936951]

91. Metz M, Pierre JL, Yan LD, Rouzier V, St-Preux S, Exantus S, et al. Hypertension continuum of care: Blood pressure screening, diagnosis, treatment, and control in a population-based cohort in Haiti. J Clin Hypertens (Greenwich). Mar 2022;24(3):246-254. [FREE Full text] [doi: 10.1111/jch.14399] [Medline: 35199944]

92. Isangula KG, Seale H, Jayasuriya R, Nyamhanga TM, Stephenson N. What factors shape doctors' trustworthiness? Patients' perspectives in the context of hypertension care in rural Tanzania. Rural Remote Health. Aug 2020;20(3):5826. [FREE Full text] [doi: 10.22605/RRH5826] [Medline: 32811153]

93. Chukwuma A, Gong E, Latypova M, Fraser-Hurt N. Challenges and opportunities in the continuity of care for hypertension: a mixed-methods study embedded in a primary health care intervention in Tajikistan. BMC Health Serv Res. Dec 03, 2019;19(1):925. [FREE Full text] [doi: 10.1186/s12913-019-4779-5] [Medline: 31796016]

94. Khetan A, Zullo M, Hejjaji V, Barbhaya D, Agarwal S, Gupta R, et al. Prevalence and pattern of cardiovascular risk factors in a population in India. Heart Asia. 2017;9(2):e010931. [FREE Full text] [doi: 10.1136/heartasia-2017-010931] [Medline: 29469903]

95. Adinkrah E, Bazargan M, Wisseh C, Assari S. Adherence to Hypertension Medications and Lifestyle Recommendations among Underserved African American Middle-Aged and Older Adults. Int J Environ Res Public Health. Sep 08, 2020;17(18):6538. [FREE Full text] [doi: 10.3390/ijerph17186538] [Medline: 32911772]

96. Onwudiwe NC, Mullins CD, Winston RA, Shaya FT, Pradel FG, Laird A, et al. Barriers to self-management of diabetes: a qualitative study among low-income minority diabetics. Ethn Dis. 2011;21(1):27-32. [Medline: 21462726]

97. Dey S, Mukherjee A, Pati MK, Kar A, Ramanaik S, Pujar A, et al. Socio-demographic, behavioural and clinical factors influencing control of diabetes and hypertension in urban Mysore, South India: a mixed-method study conducted in 2018. Arch Public Health. Nov 15, 2022;80(1):234. [FREE Full text] [doi: 10.1186/s13690-022-00996-y] [Medline: 36380335]

98. Lustman A, Comaneshter D, Vinker S. Interpersonal continuity of care and type two diabetes. Prim Care Diabetes. Jun 2016;10(3):165-170. [doi: 10.1016/j.pcd.2015.10.001] [Medline: 26530317]

99. Fung CSC, Wan EYF, Jiao F, Lam CLK. Five-year change of clinical and complications profile of diabetic patients under primary care: a population-based longitudinal study on 127,977 diabetic patients. Diabetol Metab Syndr. 2015;7:79. [FREE Full text] [doi: 10.1186/s13098-015-0072-x] [Medline: 26388950]

100. Maroof M, Faizi N, Thekkur P, Raj S, Goel S. Is the rule of halves in hypertension valid uniformly across India? A cross-sectional analysis of national family health survey-4 data. Indian J Public Health. 2022;66(3):269-275. [FREE Full text] [doi: 10.4103/ijph.ijph_2143_21] [Medline: 36149103]

101. Ali MK, Bullard KM, Gregg EW, Del Rio C. A cascade of care for diabetes in the United States: visualizing the gaps. Ann Intern Med. Nov 18, 2014;161(10):681-689. [doi: 10.7326/M14-0019] [Medline: 25402511]

102. Geldsetzer P, Manne-Goehler J, Marcus ME, Ebert C, Zhumadilov Z, Wesseh CS, et al. The state of hypertension care in 44 low-income and middle-income countries: a cross-sectional study of nationally representative individual-level data from 1·1 million adults. Lancet. Aug 24, 2019;394(10199):652-662. [doi: 10.1016/S0140-6736(19)30955-9] [Medline: 31327566]

103. Obagha CE, Danladi B, Kamateeka M, Chori BS, Ogbonnaya U, Maduka D, et al. Unmet needs of hypertension care in Nigeria: results of the community action against non-communicable diseases (COMAAND) project preintervention survey. Blood Press Monit. Feb 01, 2022;27(1):27-32. [doi: 10.1097/MBP.0000000000000561] [Medline: 34992204]

104. Gee ME, Janssen I, Pickett W, McAlister FA, Bancej CM, Joffres M, et al. Prevalence, awareness, treatment, and control of hypertension among Canadian adults with diabetes, 2007 to 2009. Can J Cardiol. May 2012;28(3):367-374. [doi: 10.1016/j.cjca.2011.08.111] [Medline: 22281410]

105. Jug J, Peček I, Bukvić S, Petrovčić M, Bosnić F, Rukavina A, et al. Continuity of care in patients with type 2 diabetes in Croatian primary care setting during COVID-19 pandemic: A retrospective observational study. Prim Care Diabetes. Dec 2022;16(6):768-774. [FREE Full text] [doi: 10.1016/j.pcd.2022.09.010] [Medline: 36220766]

106. Dalal MR, Robinson SB, Sullivan SD. Real-world evaluation of the effects of counseling and education in diabetes management. Diabetes Spectr. Nov 2014;27(4):235-243. [FREE Full text] [doi: 10.2337/diaspect.27.4.235] [Medline: 25647045]

107. Smith JJ, Johnston JM, Hiratsuka VY, Dillard DA, Tierney S, Driscoll DL. Medical home implementation and trends in diabetes quality measures for AN/AI primary care patients. Prim Care Diabetes. Apr 2015;9(2):120-126. [doi: 10.1016/j.pcd.2014.06.005] [Medline: 25095763]

108. Zhang Y, Tang W, Zhang Y, Liu L, Zhang L. Effects of integrated chronic care models on hypertension outcomes and spending: a multi-town clustered randomized trial in China. BMC Public Health. Mar 11, 2017;17(1):244. [FREE Full text] [doi: 10.1186/s12889-017-4141-y] [Medline: 28284202]

109. Hsu CH, Chou YJ, Pu C. The effect of continuity of care on emergency room use for diabetic patients varies by disease severity. J Epidemiol. Aug 05, 2016;26(8):413-419. [FREE Full text] [doi: 10.2188/jea.JE20150045] [Medline: 26902167]

110. Athinarayanan SJ, Adams RN, Hallberg SJ, McKenzie AL, Bhanpuri NH, Campbell WW, et al. Long-term effects of a novel continuous remote care intervention including nutritional ketosis for the management of type 2 diabetes: a 2-year non-randomized clinical trial. Front Endocrinol (Lausanne). 2019;10:348. [FREE Full text] [doi: 10.3389/fendo.2019.00348] [Medline: 31231311]

111. Brain M, Reynolds C, Nesbeda H, Walsh M, Fem R, Magruder A, et al. Intervisit management of patients with diabetes: synchronized phone calls. JNP. Sep 2019;15(8):e157-e160. [doi: 10.1016/j.nurpra.2019.03.020]

112. Reutens AT, Hutchinson R, Van Binh T, Cockram C, Deerochanawong C, Ho LT, et al. The GIANT study, a cluster-randomised controlled trial of efficacy of education of doctors about type 2 diabetes mellitus management guidelines in primary care practice. Diabetes Res Clin Pract. Oct 2012;98(1):38-45. [doi: 10.1016/j.diabres.2012.06.002] [Medline: 22784926]

113. Pan CC, Kung PT, Chiu LT, Liao YP, Tsai WC. Patients with diabetes in pay-for-performance programs have better physician continuity of care and survival. Am J Manag Care. Feb 01, 2017;23(2):e57-e66. [FREE Full text] [Medline: 28245660]

114. Andrich D, Foronda C. Improving glycemic control and quality of life with diabetes self-management education: a pilot project. J Contin Educ Nurs. Mar 01, 2020;51(3):119-123. [doi: 10.3928/00220124-20200216-06] [Medline: 32119106]

115. Korcegez EI, Sancar M, Demirkan K. Effect of a pharmacist-led program on improving outcomes in patients with type 2 diabetes mellitus from northern Cyprus: a randomized controlled trial. J Manag Care Spec Pharm. May 2017;23(5):573-582. [FREE Full text] [doi: 10.18553/jmcp.2017.23.5.573] [Medline: 28448779]

116. Sousa Santos F, Tavares Bello C, Roque C, Capitão R, Castro Fonseca R, Limbert C, et al. The effect of changing regular care provider in type 2 diabetes mellitus: a retrospective study. Acta Med Port. Sep 02, 2019;32(9):580-587. [FREE Full text] [doi: 10.20344/amp.11304] [Medline: 31493361]

117. Cole RE, Boyer KM, Spanbauer SM, Sprague D, Bingham M. Effectiveness of prediabetes nutrition shared medical appointments: prevention of diabetes. Diabetes Educ. 2013;39(3):344-353. [doi: 10.1177/0145721713484812] [Medline: 23589326]

118. Goudge J, Chirwa T, Eldridge S, Gómez-Olivé FXF, Kabudula C, Limbani F, et al. Can lay health workers support the management of hypertension? Findings of a cluster randomised trial in South Africa. BMJ Glob Health. 2018;3(1):e000577. [FREE Full text] [doi: 10.1136/bmjgh-2017-000577] [Medline: 29527345]

119. Lee SY, Chun SY, Park H. The impact of COVID-19 protocols on the continuity of care for patients with hypertension. Int J Environ Res Public Health. Feb 02, 2022;19(3) [FREE Full text] [doi: 10.3390/ijerph19031735] [Medline: 35162758]

120. Thomas T, Dyer W, Adams A, Grant R, Schmittdiel J. Address changes are associated with unmet glycemic targets: opportunities to improve processes and outcomes of care among people with type 2 diabetes. Perm J. Jun 29, 2022;26(2):1-10. [FREE Full text] [doi: 10.7812/TPP/21.144] [Medline: 35933662]

121. Meador M, Coronado F, Roy D, Bay RC, Lewis JH, Chen J, et al. Impact of COVID-19-related care disruptions on blood pressure management and control in community health centers. BMC Public Health. Dec 08, 2022;22(1):2295. [FREE Full text] [doi: 10.1186/s12889-022-14763-9] [Medline: 36476418]

122. Yan JW, Liu S, Van Aarsen K, Columbus MP, Spaic T. Do adult patients with type 1 or 2 diabetes who present to the emergency department with hyperglycemia have improved outcomes if they have access to specialized diabetes care? Can J Diabetes. Feb 2021;45(1):59-63. [doi: 10.1016/j.jcjd.2020.05.011] [Medline: 32847767]

123. Jermendy G, Wittmann I, Nagy L, Kiss Z, Rokszin G, Abonyi-Tóth Z, et al. Persistence of initial oral antidiabetic treatment in patients with type 2 diabetes mellitus. Med Sci Monit. Feb 2012;18(2):CR72-CR77. [FREE Full text] [doi: 10.12659/msm.882459] [Medline: 22293880]

124. Kunwar A, Durgad K, Kaur P, Sharma M, Swasticharan L, Mallela M, et al. Interventions to ensure the continuum of care for hypertension during the COVID-19 pandemic in five Indian states-India Hypertension Control Initiative: Global Heart. Glob Heart. 2021;16(1):82. [FREE Full text] [doi: 10.5334/gh.1010] [Medline: 34909373]

125. Malcolm JC, Maranger J, Taljaard M, Shah B, Tailor C, Liddy C, et al. Into the abyss: diabetes process of care indicators and outcomes of defaulters from a Canadian tertiary care multidisciplinary diabetes clinic. BMC Health Serv Res. Aug 10, 2013;13:303. [FREE Full text] [doi: 10.1186/1472-6963-13-303] [Medline: 23938105]

126. Hanafi NS, Abdullah A, Lee PY, Liew SM, Chia YC, Khoo EM. Personal continuity of care in a university-based primary care practice: impact on blood pressure control. PLoS One. 2015;10(7):e0134030. [FREE Full text] [doi: 10.1371/journal.pone.0134030] [Medline: 26214304]

127. Hong JS, Kang HC. Continuity of ambulatory care and health outcomes in adult patients with type 2 diabetes in Korea. Health Policy. Feb 2013;109(2):158-165. [doi: 10.1016/j.healthpol.2012.09.009] [Medline: 23093021]

128. Senteio CR, Akincigil A. Illuminating racial inequity in diabetes control: differences based on gender and geography. J Racial Ethn Health Disparities. Jun 2021;8(3):704-711. [doi: 10.1007/s40615-020-00830-7] [Medline: 32729106]

129. Madede T, Damasceno A, Lunet N, Augusto O, Silva-Matos C, Beran D, et al. Changes in prevalence and the cascade of care for type 2 diabetes over ten years (2005-2015): results of two nationally representative surveys in Mozambique. BMC Public Health. Nov 25, 2022;22(1):2174. [FREE Full text] [doi: 10.1186/s12889-022-14595-7] [Medline: 36434584]

130. Holman N, Khunti K, Wild SH, Sattar N, Knighton P, Young B, et al. Care processes in people in remission from type 2 diabetes: a cohort study using the National Diabetes Audit. Diabet Med. Mar 2023;40(3):e15016. [FREE Full text] [doi: 10.1111/dme.15016] [Medline: 36440921]

131. Wollum A, Gabert R, McNellan CR, Daly JM, Reddy P, Bhatt P, et al. Identifying gaps in the continuum of care for cardiovascular disease and diabetes in two communities in South Africa: baseline findings from the HealthRise project. PLoS One. 2018;13(3):e0192603. [FREE Full text] [doi: 10.1371/journal.pone.0192603] [Medline: 29538420]

132. Londoño Agudelo E, Pérez Ospina V, Battaglioli T, Taborda Pérez C, Gómez-Arias R, Van der Stuyft P. Gaps in hypertension care and control: a population-based study in low-income urban Medellin, Colombia. Trop Med Int Health. Aug 2021;26(8):895-907. [FREE Full text] [doi: 10.1111/tmi.13599] [Medline: 33938098]

133. Olry de Labry Lima A, Bermúdez Tamayo C, Pastor Moreno G, Bolívar Muñoz J, Ruiz Pérez I, Johri M, Prados Quel; et al. Effectiveness of an intervention to improve diabetes self-management on clinical outcomes in patients with low educational level. Gac Sanit. 2017;31(1):40-47. [FREE Full text] [doi: 10.1016/j.gaceta.2016.05.017] [Medline: 27477476]

134. Leniz J, Gulliford MC. Continuity of care and delivery of diabetes and hypertensive care among regular users of primary care services in Chile: a cross-sectional study. BMJ Open. Oct 28, 2019;9(10):e027830. [FREE Full text] [doi: 10.1136/bmjopen-2018-027830] [Medline: 31662353]

135. Hallberg SJ, McKenzie AL, Williams PT, Bhanpuri NH, Peters AL, Campbell WW, et al. Effectiveness and Safety of a Novel Care Model for the Management of Type 2 Diabetes at 1 Year: An Open-Label, Non-Randomized, Controlled Study. Diabetes Ther. Apr 2018;9(2):583-612. [FREE Full text] [doi: 10.1007/s13300-018-0373-9] [Medline: 29417495]

136. Collier IA, Baker DM. Implementation of a pharmacist-supervised outpatient diabetes treatment clinic. Am J Health Syst Pharm. Jan 01, 2014;71(1):27-36. [doi: 10.2146/ajhp130200] [Medline: 24352179]

137. Ramli AS, Selvarajah S, Daud MH, Haniff J, Abdul-Razak S, Tg-Abu-Bakar-Sidik TMI, et al. EMPOWER-PAR Investigators. Effectiveness of the EMPOWER-PAR Intervention in Improving Clinical Outcomes of Type 2 Diabetes Mellitus in Primary Care: A Pragmatic Cluster Randomised Controlled Trial. BMC Fam Pract. Nov 14, 2016;17(1):157. [FREE Full text] [doi: 10.1186/s12875-016-0557-1] [Medline: 27842495]

138. LaMonica LC, McGarvey ST, Rivara AC, Sweetman CA, Naseri T, Reupena MS, et al. Cascades of diabetes and hypertension care in Samoa: Identifying gaps in the diagnosis, treatment, and control continuum - a cross-sectional study. Lancet Reg Health West Pac. Jan 2022;18:100313. [FREE Full text] [doi: 10.1016/j.lanwpc.2021.100313] [Medline: 35024652]

139. Kothavale A, Puri P, Sangani PG. Quantifying population level hypertension care cascades in India: a cross-sectional analysis of risk factors and disease linkages. BMC Geriatr. Feb 04, 2022;22(1):98. [FREE Full text] [doi: 10.1186/s12877-022-02760-x] [Medline: 35114935]

140. Mathew BK, De Roza JG, Liu C, Goh LJ, Ooi CW, Chen E, et al. Which Aspect of Patient-Provider Relationship Affects Acceptance and Adherence of Insulin Therapy in Type 2 Diabetes Mellitus? A Qualitative Study in Primary Care. Diabetes Metab Syndr Obes. 2022;15:235-246. [FREE Full text] [doi: 10.2147/DMSO.S344607] [Medline: 35153494]

141. Lee EL, Wong PS, Tan MY, Sheridan J. What role could community pharmacists in Malaysia play in diabetes self-management education and support? The views of individuals with type 2 diabetes. Int J Pharm Pract. Apr 2018;26(2):138-147. [doi: 10.1111/ijpp.12374] [Medline: 28574154]

142. Datta BK, Ansa BE, Husain MJ. An analytical model of population level uncontrolled hypertension management: a care cascade approach. J Hum Hypertens. Jul 05, 2021;36(8):726-731. [FREE Full text] [doi: 10.1038/s41371-021-00572-x] [Medline: 34226635]

143. Basu S, Flood D, Geldsetzer P, Theilmann M, Marcus ME, Ebert C, et al. Estimated effect of increased diagnosis, treatment, and control of diabetes and its associated cardiovascular risk factors among low-income and middle-income countries: a microsimulation model. Lancet Glob Health. Nov 2021;9(11):e1539-e1552. [FREE Full text] [doi: 10.1016/S2214-109X(21)00340-5] [Medline: 34562369]

144. Pickersgill SJ, Msemburi WT, Cobb L, Ide N, Moran AE, Su Y, et al. Modeling global 80-80-80 blood pressure targets and cardiovascular outcomes. Nat Med. Aug 2022;28(8):1693-1699. [FREE Full text] [doi: 10.1038/s41591-022-01890-4] [Medline: 35851877]

145. Khalid A, Dong Q, Chuluunbaatar E, Haldane V, Durrani H, Wei X. Implementation Science Perspectives on Implementing Telemedicine Interventions for Hypertension or Diabetes Management: Scoping Review. J Med Internet Res. Mar 14, 2023;25:e42134. [FREE Full text] [doi: 10.2196/42134] [Medline: 36917174]

146. Nilsen P, Bernhardsson S. Context matters in implementation science: a scoping review of determinant frameworks that describe contextual determinants for implementation outcomes. BMC Health Serv Res. Mar 25, 2019;19(1):189. [FREE Full text] [doi: 10.1186/s12913-019-4015-3] [Medline: 30909897]

Abbreviations

HIC: high-income country
LMIC: low- and middle-income country
NCD: noncommunicable disease