International Journal of Community Medicine and Public Health
Alresheedi HA et al. Int J Community Med Public Health. 2023 Sep;10(9):3373-3382
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20232706

Systematic Review

The contribution of nursing expertise to the management of complex comorbidities in internal medicine setting: a systematic review

Hend A. Alresheedi[1]*, Norah A. Alanazi[2], Mariam H. Alshammari[3], Khulud M. Alotaibi[2], Abeer O. Al Wagdani[4], Najla H. Alotaibi[5], Amal M. Alotibi[6], Hind M. Al Rashidi[7], Nourah K. Eid[8], Shuruq N. Alshahrani[8]

[1]Alsaadh Primary Healthcare Center, Ministry of Health, Riyadh, Saudi Arabia
[2]Nursing Department, General Directorate of Health Affairs, Riyadh, Saudi Arabia
[3]Department of Oncology and Hematology, King Fahad Medical City, Riyadh, Saudi Arabia
[4]Nursing Administration Department, King Faisal Medical Complex, Taif, Saudi Arabia
[5]Nursing Department, King Salman Hospital, Riyadh, Saudi Arabia
[6]Nursing Department, Al Bjadyah General Hospital, Al Bjadyah, Saudi Arabia
[7]Nursing Department, Al Yamamah Hospital, Riyadh, Saudi Arabia
[8]Nursing Department, King Saud Medical City, Riyadh, Saudi Arabia

Received: 06 August 2023
Revised: 10 August 2023
Accepted: 25 August 2023

***Correspondence:**
Dr. Hend A. Alresheedi,
E-mail: hendalresheedi@gmail.com

ABSTRACT

The burden of comorbidities is on the rise, and nursing has long been recognized as having a crucial role in assisting individuals to manage long-term conditions. Over the past ten years, a growing number of chronic disease delivery models have given nurses great opportunities to develop roles and abilities focused on effective chronic disease management. We have conducted both electronic and manual searches within the potential databases to find relevant studies. Studies from the years 2010-2023 were included. Case reports with limited sample sizes, no descriptive statistics, review papers, and meta-analyses were excluded from this review. A quality assessment for all included studies was performed. Final inclusion resulted in a total of eight studies. Cardiovascular diseases, hypertension, and diabetes were the comorbidities reported by the majority of the studies, while chronic obstructive pulmonary disease, end-stage renal disease, and metastatic cancer were reported by each study. Overall, the findings suggest that nurses play a significant role in the management of comorbidities among patients, further improving patient outcomes, reducing readmissions and hospital costs, and preventing complications. The care of patients with complicated medical and social needs is coordinated through the employment of a wide range of interventions in an internal medicine setting. Nurse-led interventions /programs can play a vital part in reducing the burden of rising comorbidities among patients. However, the role of nurses in the internal medicine setting needs to be highlighted further by evidence-based research.

Keywords: Nurse, Role, Internal, Medicine, Comorbidities

INTRODUCTION

The occurrence of combinations of chronic medical diseases is frequent. Understanding the fundamental causes of diseases and how they interact may enable the treatment of several complicated problems with a single or consolidated method, improving patient outcomes while lowering costs. Feinstein used the term comorbidity in 1970 to refer to a distinct additional clinical entity that manifests itself alongside an index disease. In the literature, the term has been used to denote either coexisting" or co-occurring diseases.[1] The management of

individuals who have several concurrent diseases is becoming an increasingly important aspect of healthcare because they are becoming more common than previously. Comorbidity is linked to less favorable health outcomes, more difficult clinical management, and higher medical expenses.[2]

Multimorbidity is defined as the co-occurrence of two or more chronic conditions, while the concept of complex multimorbidity, or comorbidity, is defined as the co-occurrence of three or more chronic conditions affecting three or more different body systems within one person, without defining an index chronic condition. Compared to conventional multimorbidity, it is more discriminating and is more likely to identify individuals who require greater advanced care.[3] People with multimorbidity need more ambulatory and inpatient care than people without multimorbidity, and they also have worse functional status, quality of life, and health outcomes. Additionally, their mortality rate is higher. Globally, the population is aging, and multimorbidity rates are higher among older people. Multimorbidity is not only a problem for the elderly, though. Almost 30% of cases with four or more conditions are observed in individuals aged 65 or less. Furthermore, comorbidities are linked to prolonged hospital stays.[4]

Care coordination and continuity for patients with chronic diseases can be challenging. Multimorbidity poses multiple challenges for nurses in both hospital and community settings. Errors may occur, among others, when entering and maintaining healthcare records, coordinating with multidisciplinary teams, and discharging patients. The profession must be ready for this since the future of nursing will unavoidably involve serving more patients with various comorbidities and long-term conditions in diverse settings.[5] Since the transition from acute to chronic care models has directed greater attention to a care process where the patient is acknowledged as an active participant in care, nursing has long been recognized as having a crucial role to play in assisting individuals to manage long-term conditions. Over the past ten years, a growing number of chronic disease delivery models have given nurses great opportunities to develop roles and abilities focused on effective chronic disease management. Nursing has acknowledged new ways of working with patients within chronic care models.[6]

Nurse-led primary care is just as high-quality as primary care provided by clinicians when it is provided by skilled nurses; however, it shouldn't be seen as a replacement for it. Traditional holistic nursing care relies on a therapeutic connection where the patient's objectives and wishes are at the center of their care if it is given within the context of a supportive and suitably resourced organization. Nursing treatments are perfectly adapted to helping multimorbid patients, whose goals may shift over time and aren't always related to particular illnesses. Nurses need a solid evidence base to guide their practice to achieve this effectively.[7] Clinical outcomes and quality of care are improved, costs are decreased, staff communication is improved, the safety of vulnerable patients during transition is increased, and unplanned readmissions are decreased owing to nurse-led care coordination interventions. It should be highlighted that nurses may be hired to perform just care coordination tasks or they may combine care coordination with larger team management responsibilities or with clinical care delivery, depending on local needs and resources.[8] In the present review, we aim to collect all potential evidence from relevant studies that report the contribution of nursing expertise to the management of complex comorbidities in internal medicine settings.

METHODS

Definition of outcomes and inclusion criteria

Our objective was to assess and evaluate the role of nursing expertise in the management of complex comorbidities among patients. Consequently, we included original research studies that described or discussed the contribution of expertise and skills of nurses to managing comorbidities, while review articles and meta-analyses were excluded. Moreover, case reports with limited sample sizes and no descriptive statistics were also excluded from this review. Other exclusion criteria were nonhuman or laboratory studies, non-original investigations or incomplete studies, abstract-only articles, protocols, theses, and articles that were not published in English or with no available English information.

Search strategy

After obtaining our desired outcomes, we performed a brief manual screening of potentially included studies to identify relevant keywords for the most appropriate search term. Our search term (contribute or contribution or role or influence) and (nurse or nursing) and (expertise or skills or knowledge) and (manage or management) and ("complex comorbidities"[mesh terms] or comorbid or comorbidity) and ("internal medicine"[mesh terms]) and (patient or patients) databases including PubMed, Google Scholar, Cochrane library, Web of Science and Science Direct. Our search was restricted to the title and abstract of the search results to ensure we include all relevant studies. All results were then saved to an Endnote library, where we identified and removed duplicates across the different databases. Additionally, we manually searched the reference lists of the included studies and relevant reviews, as well as similar article sections in PubMed, to identify any missed studies by our electronic search strategy. We followed the preferred reporting items for systematic reviews and meta-analyses (PRISMA) guidelines throughout all stages of this systematic review.[9]

Screening and extraction

To ensure the accuracy and quality of our review process, we implemented a double screening strategy, which involved screening both titles/abstracts as well as full texts. Two reviewers conducted the screening process in a

blinded manner, and a senior member evaluated the entire process and facilitated discussions among the reviewers in case of discrepancies. We constructed an extraction sheet that was organized in a manner relevant to our research objectives and included baseline characteristics, publication details, abstracts, decisions to include or exclude articles, and the reasons for exclusion. We also identified whether each study was a clinical trial or not. We made sure to include all relevant articles that met our inclusion criteria.

Quality assessment

We extracted information from the included studies regarding the potential risk of bias in these studies. To assess the quality of observational studies, we used the Newcastle-Ottawa scale (NOS), which comprises three domains: selection, comparability, and reporting of outcomes/exposure.[10] Studies were graded on a scale of 0 to 10 based on the degree of bias. For the randomized control trials included in our review, we used the JADAD scale to assess quality. This tool assesses the risk of bias in six domains, including randomization, blinding, inclusion and exclusion criteria, withdrawal and dropouts, statistical analysis, and reporting of outcome data. It is also graded from 0 to 10.[11]

RESULTS

Search results

We conducted the search strategies as described above and identified a total of 2449 citations, which were then reduced to 1224 after removing duplicates. After screening titles and abstracts, only 195 citations were considered eligible for the next steps. Full-text screening narrowed the number to eight articles matching our inclusion and exclusion criteria. Figure 1 shows the detailed search strategy and screening process.

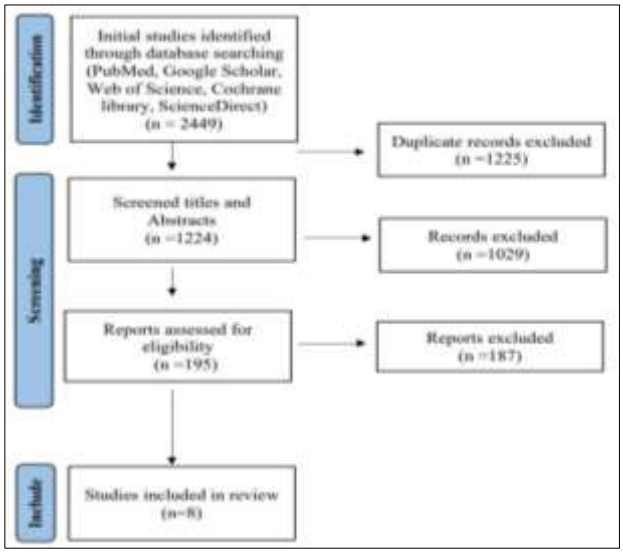

Figure 1: PRISMA flow diagram of study selection.

Results of quality assessment

The quality assessment of the included studies revealed that the majority of studies had good quality and satisfactory results with a low risk of bias. The JADAD scale also showed an overall low risk of bias for the included trials. Detailed results of the quality assessment according to the NOS and modified JADAD scales are illustrated in Tables 1 and 2.

Characteristics of the included studies

We included eight studies that recruited 8687 patients and were published between 2010 and 2023. The total population comprised 4412 males and 3587 females, with only two studies not reporting gender distribution or segregation. The majority of the studies were clinical trials, with three randomized control trials among them, followed by two cohort studies and one retrospective observational study. Regarding the geographical distribution of the included studies, the majority of the studies were from the United States of America, followed by two studies from the Netherlands, and each study was from Canada, Australia, and Taiwan. All the baseline characteristics of these studies are shown in Table 3. There are variations in the sample size of the included papers, which are likely due to the objective of the specific study and the design.

Study outcome measures

Cardiovascular diseases, hypertension, and diabetes were the comorbidities reported by the majority of the studies, while chronic obstructive pulmonary disease, end-stage renal disease, and metastatic cancer were reported by each study. Bosworth et al reported that home-based telemonitoring services for blood pressure monitoring and recording, in addition to behavioral and medication counseling, were provided by skilled nurses, which resulted in an improvement in the rates of blood pressure control.[12] Day et al narrated that evidence-based care through a coordinated diabetes disease management model was implemented by nurses, which resulted in significant improvements in patient outcomes, including reductions in hypoglycemia incidence and sliding scale insulin orders.[13] Additionally, Harbman depicted that through health teaching, guidance and counseling, case management, medication adjustments, smoking cessation odds ratio (OR 5), blood pressure (OR 15), attendance at cardiac rehabilitation (OR 7), physical activity five days a week (OR 17), physical activity five days a week (OR 34), achieving a glycated haemoglobin <7% in those with diabetes (OR 10), triglyceride levels (p=0.02), statin use at follow-up (p=0.05), and number of weeks to cardiac rehabilitation (p=0.05) were all significantly improved.[14]

Significant improvements in patient activation (p<0.001), chronic obstructive pulmonary disease (COPD) related quality of life (p=0.012), COPD knowledge (p<0.001), and inhaler device technique (p=0.001) which further improved patient self-efficacy for their COPD as well as

overall health behavior due to advanced nursing care were reported by Ansari et al.[15] Lo et al observed a shorter length of stay in the community-acquired pneumonia group than usual care, which further reduced hospital costs.[16]

Jepma et al noted that nurse-coordinated referral to a community-based lifestyle intervention was at least as beneficial in reducing lifestyle-related risk factors in older patients as it was in younger patients, despite older patients having more severe cardiovascular risk profiles and comorbidities. Older patients were more likely to achieve ≥5% weight loss.[17]

Furthermore, significantly lower odds of readmission at 30 days (OR=0.512, 95% CI 0.392 to 0.668) and 90 days (OR=0.591, 95% CI 0.483 to 0.723) were depicted by Kriplani et al.[18] Another study by Jepma et al reported that due to the post-discharge support and continuity of care they received, participants felt supported by the transitional care intervention. Although the degree to which the program was thought to have helped participants recover varied. While some individuals felt their comorbidities or fragility were a hindrance, others reported physical benefits. Though some participants did not see the increased value, the community nurse's home visits were appreciated.[19] Overall, the findings suggest that nurses play a significant role in the management of comorbidities among patients, further improving patient outcomes, reducing readmissions and hospital costs, and preventing complications.

Table 1: Detailed Newcastle-Ottawa scale of each non- randomized observational study.

Study	Selection	Comparability	Outcome	Total quality score
Day et al[2]	3	0	2	5
Harbman[3]	4	0	2	6
Ansari et al[5]	3	0	2	5
Kripalani et al[9]	3	2	1	6

Table 2: A detailed JADAD scale summary of RCT.

Corresponding author	Was the research described as randomized	Was the approach of randomization inappropriate	Was the research described as blinding?	Was the approach of blinding	Was there a presentation n of withdrawals and dropouts	Was there a presentation of the inclusion/ exclusion and criteria	Was the approach used to assess adverse effects described?	Was the approach of statistical analysis described?	Total
Bosworth et al[1]	1	1	1	1	0	1	0	1	6
Lo et al[7]	1	1	1	1	0	1	0	1	6
Jepma et al[8]	1	1	0	0	0	1	0	1	4
Jepma et al[10]	1	1	1	0	0	1	0	1	5

Table 3: Base line of the study.

Author	Country	Year	Study	Total participants	Mean age	Gender (male/female)
Bosworth et al[38]	USA	2010	RCT	600	NR	NR
Day et al[39]	USA	2014	Observational study	22	NR	12/10
Harbman[14]	Canada	2014	Prospective cohort study	65	58.3 ±9.87	54/11
Ansari et al[40]	Australia	2017	Cohort study	50	69.22±8.43	25/25
Lo et al[41]	Taiwan	2018	Clinical trial	72	NR	NR
Jepma et al[42]	Netherlands	2019	RCT	824	≥65 years: 69.2±3.9 versus <65 years: 53.7±6.6	646/178
Kripalani et al[18]	USA	2019	Retrospective	7038	Usual care: 62.2±16.9, TCC care: 64.0±13.9	3675/3363
Jepma et al[43]	Netherlands	2021	RCT	16	82.4±5.3	NR

RCT: randomized control trial, NR: not reported, NP: nurse practitioner, TCC: transition care coordinators

Table 3: Outcomes of the study.

Author	Nurse experience	Comorbidities	Complications (if any)	Nursing intervention	Outcome of intervention/ management	Follow up
Bosworth et al[38]	NR	NR	Hypertension	Home blood pressure values transmitted via telemonitoring devices over standard telephone lines.	Patients were divided into three groups: those receiving behavioral intervention only, medication intervention only, and a combination of both. The results showed that the rates of improved blood pressure (BP) control were 15%, 15%, and 25% in the respective groups.	18 months
Day et al[39]	Specialist practitioner	Diabetes mellitus	Hypoglycemia	Implemented evidence-based care: CDDM	Significant improvements in patient outcomes, including reductions in hypoglycemia incidence and sliding scale insulin orders, while increasing resident-centered care and improving chronic kidney disease screenings	NR
Harbman[14]	Practitioner	Metastatic cancer, end stage heart or renal disease	NR	Health teaching, guidance and counselling, case management, medication adjustments	Significantly improve achievement of the following target goals when compared to usual care: smoking cessation (OR 5), blood pressure (OR 15), attendance at cardiac rehabilitation (OR 7), physical activity five days a week (OR 17), physical activity five days a week (OR 34), achieving a glycated haemoglobin <7% in those with diabetes (OR 10), triglyceride levels (p=0.02), statin use at follow-up (p=0.05), and number of weeks to cardiac rehabilitation (p=0.05)	3 months
Ansari et al[40]	Practice nurse	Spirometry diagnosis of COPD	NR	NR	Significant improvement in patient activation (p<0.001), COPD-related quality of life (p=0.012), COPD knowledge (p<0.001) and inhaler device technique (p=0.001), with no significant change in perception of multi-morbidity (p=0.822) or COPD-related multi-morbidity (0.084). The programme improved patients self-efficacy for their COPD as well as overall health behaviour. Significant improvement in patient activation (p<0.001), COPD related quality of life (p=0.012), COPD knowledge (p<0.001) and inhaler device technique (p=0.001). Improved patient self-efficacy for their COPD as well as overall health behavior.	6 months
Lo et al[41]	Usual medical nursing	NR	NR	Usual service and CAP service"	LOS in CAP service was significantly shorter compared to usual service (6.5 vs 7.8 days, absolute difference 1.3 days [95%CI (-2.000,0.000)]) and decreased total hospital cost (24670 vs 29169 NTD, p=0.313). prolongation of oral antibiotic treatment after discharge was noted. (27.8% vs 5.6%, p=0.01).	NR

Continued.

Author	Nurse experience	Comorbidities	Complications (if any)	Nursing intervention	Outcome of intervention/ management	Follow up
					There were no differences in 30-day mortality rates or recurrence rates within 14 days	
Jepma et al[42]	Nurse practitioner	Hypertension, diabetes mellitus and peripheral artery disease	Cardio vascular risk profiles	NR	Older patients were more likely to achieve ≥5% weight loss (OR old 5.58, 95% CI 2.77–11.26 vs OR young 1.57, 95% CI 0.98-2.49, P interaction=0.003) and younger patients were more likely to show non-improved individual LRFs (OR old 0.38, 95% CI 0.22–0.67 vs OR young 0.88, 95% CI 0.61–1.26, p interaction=0.01).	NR
Kripal-ani et al[18]	Registered nurses	Elixhauser index	NR	Usual care and	Significantly lower odds of readmission at 30 days (OR=0.512, 95% CI 0.392 to 0.668) and 90 days (OR=0.591, 95% CI 0.483 to 0.723). Adjusted costs were significantly lower at 30 days (difference=$3,969, 95% CI $5,099 to $2,691) and 90 days (difference=$5,684, 95% CI $7,602 to $3,627).	NR
Jepma et al[43]	General practitioner, cardiologist, hospital-based cardiac nurse specialist	One participant therefore ended the home-based CR prematurely. In other participants, the experienced symptoms (dyspnea, tiredness, joint problems) impeded them during the physical exercises	Heart failure: 56.3%	Cardiac research nurse during a face-to-face handover with the community nurse, satisfied about the relationship with the healthcare providers, community nurse, participants experienced support in checking their health status by measurement of vital signs. All participants received home visits of the community nurse post-discharge.	Reported physical improvements while others felt impeded by comorbidities or frailty. The home visits by the community nurse were appreciated, although some participants did not recognize the added value. Participants with an existing healthcare provider network preferred to consult these providers instead of the providers who were involved in the transitional care intervention.	0

IHD: ischemic heart disease, patient activation measure: PAM 13, COPD knowledge questionnaire: COPD-Q, COPD assessment test: CAT, i/e: included versus excluded significant, coordinated diabetes disease management model: CDDM

DISCUSSION

Healthcare needs will continue to increase as the population ages and chronic diseases become a global epidemic. So, by potentially bolstering the healthcare workforce, advanced practise nurses can offer value and broaden access to healthcare.[20] Most patients in internal medicine are elderly; they have many co-morbidities, which are typically chronic illnesses rather than acute or self-limiting ones. A complex intervention involving a thorough assessment and both continuous and multi-disciplinary care for the complex patients found in internal medicine wards in order to maintain their health and ability to function and to prevent or delay disability, frailty, and displacement from home and community is needed and practiced.[21] Registered nurses offer a wide range of services to patients with chronic diseases that are not exceptionally challenging. These include the management of medications, health education, and treatments for the prevention and treatment of chronic diseases.[22]

However, when coordinating care for individuals with complex needs, these actions appear to be particularly prevalent. Clinical skills-related tasks include conducting a thorough assessment that takes into account the patient's medical needs and goals, monitoring the patient's symptoms carefully, prompt recognition of any adverse effects or red flags, reconciling medications, educating the patient about self-management of their conditions, and providing direct evidence-based care. Previous research findings exhibit that there is a greater chance to increase the quality of care and clinical outcomes, as well as

decrease beneficiaries' need for hospitalisation when nurses are an essential element of direct care under the direction of the interdisciplinary team.[23,24]

The results of our study illustrate that skilled nurses can play a vital role in the management of complex comorbidities by enhancing patient outcomes and satisfaction, decreasing readmissions, and preventing serious complications. Similarly, findings from an evidence-based analysis reported that the primary care of patients with chronic diseases may be improved by nurses with additional skills, education, or scope of practice. Working independently, specialized nurses could produce equivalent health results to physicians. Additionally, it was observed that specialized nurses who collaborated with medical professionals reduced hospital admissions and enhanced specific patient outcomes for patient with diabetes, coronary artery disease, or heart failure patients. Patients who received treatment from a nurse were happier and frequently adhered to treatment. However, it is still uncertain whether specialized nurses reduce clinicians' burden or raise the quality of life.[25]

Georgiopoulos et al. reported that recent research suggests that interventions delivered by nurses for hypertensive patients within the framework of a healthcare team can enhance blood pressure control. Subjects who took part in nurse intervention programs showed improvement in terms of treatment adherence. Programs that educate people about changing their lifestyles and understanding diseases had higher outcomes for improved blood pressure control and medication adherence.[26] Similarly, in our study, it was observed that blood pressure and cardiovascular risk factors improved through nursing interventions. Likewise, results from another systematic review concluded that digital health interventions led by nurses were more successful than standard treatment in lowering blood pressure and improving self-management in hypertensive patients. Digital technologies can be used by nurse-led programs to improve blood pressure control and self-management behaviours including diet and medication adherence, in real-time. Nurses can conduct patient-centered treatments, including reflecting on patients' needs and collaborative decision-making, without being constrained by physical space or by the time allotted for treatment by using nurse-led digital health interventions.[27]

The expertise and skills of nurses are a significant contribution to healthcare systems; however, these skills and expertise are gained over time with continuous learning. As Willman et al. narrated, in addition to using nursing care plans and protocols, complex patient scenarios include nursing interventions and decision-making processes that incorporate professional judgment based on experience. Newly graduated nurses in complex patient situations allude to the instability, variability, and ambiguity of a patient's medical care and daily life, and how these factors are further complicated by the nursing decisions and interventions made. For clinical competence to develop and go from one competence stage to the next, intellectual and critical thinking are crucial. Experience alone does not always result in enhanced competence. Competence is also increased by lifelong learning. Reflection is a dynamic process that involves developing fresh views in order to advance nursing.[28]

In our findings, significant improvements in COPD-related quality of life, knowledge, and inhaler device technique, along with improvements in patient self-efficacy for their COPD as well as overall health behavior due to advanced nursing care, were noted. Similarly, results of another systematic review revealed that by increasing the patient's understanding of disease management, nursing care for COPD patients leads to better results in the daily management of the condition. The physical status, quality of life, and anxiety of COPD patients were improved with nurse-led interventions, which may have also resulted in fewer hospital admissions.[29] Likewise, Wang et al reported that the effectiveness of the nurse-led self-management program for COPD patients was demonstrated by a reduction in hospital readmissions and emergency department visits, as well as an increase in exercise tolerance, health-related quality of life, and patient satisfaction.[30] Furthermore, Hu et al reported that after nursing care, the study group scored better on symptom management, daily life management, emotion management, information management, and management efficiency than the control group ($p<0.05$). The ability, contentment, and compliance of older COPD patients can be successfully improved with nurse-led health education based on the concepts of knowledge, belief, and practice.[31]

Carrier and Newbury narrated that long-term care for patients with chronic diseases is generally acknowledged to take place in primary and community care settings, with a focus on case management for patients with complicated requirements. Community nurses are in a prime position to offer care to all individuals with long-term diseases, from health promotion, prevention, and self-care encouragement to caring for individuals with more complicated needs, comorbidities, and end-of-life care. Developing self-care, empowerment, community engagement, and serving as an advocate for clients and their carers are all important components of the multidisciplinary team and should be led by community nurses when providing complex care at home to people with long-term conditions.[32] Wallace et al described that senior registered nurses who specialized in cancer care and have clinical knowledge in that field of nursing are expected to participate in multidisciplinary discussions, take the initiative in addressing patient and carer communication concerns, make sure that holistic needs assessments are considered in decision-making, and recognize high-risk patients who are likely to require complex care plans. They may therefore make sure that specific patients' requirements, values, and priorities are taken into account while making clinical decisions. Studies have demonstrated that clinical nurse specialists accomplish this in practice by providing information regarding patient preferences or psychosocial aspects,

serving as the patient's advocate, and contesting judgments.[33]

Gossec et al described that some of the comorbidities are preventable or identifiable through screening. Risk factors can be controlled, prompt and early diagnosis of malignancies can be made, infections like influenza and pneumococcus can be partially prevented by receiving the recommended vaccinations, and osteoporosis can be detected and treated timely. Strong evidence supports the long-term benefits of nurse-led strategies for comorbidity screening and prevention. The authors further reported that comorbidity screening was subpar, but over the course of three years, it significantly improved owing to a nurse-led program that checked for comorbidity screening systematically and offered patient counseling.[34] Additionally, Dougados et al narrated that nurse-led programs have proven to be beneficial for the cost-effective management of cardiovascular risk factors, increased pneumococcal vaccination rates in patients at risk, and the management of osteoporosis with risk of fractures in older women.[35] Moreover, Molto et al suggested that even in a young cohort of patients with axial spondyloarthritis, the short-term benefit of a nurse-led program for routine screening of comorbidities for their management by recommendations is reported.[36]

You et al demonstrated that the usefulness of various interventional techniques has been established in earlier research from Western nations that have assessed post-discharge programs intended to decrease rehospitalization and boost the survival rates of patients with chronic heart failure. Studies of nurse-led programs of care for chronic heart failure, which are interesting and significant, also corroborated these advantages, indicating that nurses can play beneficial roles in the treatment of chronic heart failure patients after discharge. Studies from Western nations have shown that nurse-led care programs can be a practical and affordable strategy. A nurse-led discharge program of care for patients with chronic heart failure can boost adherence to drug therapy that follows guidelines, enhance the quality of life, and lower readmission rates.[37] Our findings also suggest that nursing intervention was associated with reduced readmission. The systematic search methodology and the analysis of all keywords in this field are this study's main advantages and strengths. Another benefit of this review is that the majority of the included studies are clinical trials, generating more robust evidence. However, the publication period and exclusion of review papers, in addition to considering only English papers, are limitations of this study.

Furthermore, more complicated or complex comorbidities were not observed in our included studies and literature search, which is due to the dearth of studies in the literature. In the literature, the contribution of nurses to the management of complex comorbidities is not well defined, which necessitates the need for further research in this aspect.

CONCLUSION

The care of patients with complicated medical and social needs is coordinated through the employment of a wide range of interventions in an internal medicine setting. Nurse-led interventions and programs can play a vital role in reducing the burden of rising comorbidities among patients by improving medication adherence, health education, and promotion, enhancing patient outcomes and quality of life, reducing hospital readmissions, and preventing serious complications. However, the role of nurses needs to be highlighted further by evidence-based research.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

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Cite this article as: Alresheedi HA, Alanazi NA, Alshammari MH, Alotaibi KM, Al Wagdani AO, Alotaibi NH, et al. The contribution of nursing expertise to the management of complex comorbidities in internal medicine setting: a systematic review. Int J Community Med Public Health 2023;10:3373-82.