Pulm Ther (2023) 9:195–206
https://doi.org/10.1007/s41030-023-00218-y

REVIEW

Engaging Ethnically Diverse Populations in Self-Management Interventions for Chronic Respiratory Diseases: A Narrative Review

Stacy Maddocks · Pat Camp · Clarice Tang

Received: November 27, 2022 / Accepted: January 30, 2023 / Published online: February 11, 2023

ABSTRACT

The burden of chronic respiratory diseases continues to rise globally. Comprehensive management relies on a combination of treatment approaches including patient self-management, where health professionals are required to educate and support patients to take control of their disease. When self-management interventions are suitably directed and effectively executed, outcomes point to increases in quality of life and a reduction in unscheduled or emergency consultations for people living with chronic respiratory disease. However, despite these positive gains, the literature reveals poor trends of engagement with this management approach and reduced access to appropriately designed programs for people from ethnically diverse populations, including migrants and refugees. The purpose of this review article is to discuss factors influencing engagement in chronic respiratory disease self-management among people from ethnically diverse backgrounds and to propose strategies to improve the participation of this population in these interventions in the future.

Keywords: Culturally and linguistically diverse; Ethnic minority; Chronic respiratory disease; Self-management; Cultural competence

S. Maddocks
Department of Physical Therapy, University of British Columbia, Vancouver, Canada

S. Maddocks · P. Camp
Centre for Heart Lung Innovation, University of British Columbia, Vancouver, Canada

S. Maddocks · P. Camp
Physiotherapy University of KwaZulu-Natal, Durban, South Africa

C. Tang (✉)
School of Health Sciences, Western Sydney University, Locked Bag 1797, Penrith, NSW 2751, Australia
e-mail: Clarice.tang@westernsydney.edu.au

C. Tang
Allied Health, South Western Sydney Local Health District, Sydney, Australia

Key Summary Points

Ethnically diverse migrant populations living outside of their country of birth make up a substantial proportion of people living with chronic respiratory disease globally.

Engagement in self-management interventions for chronic respiratory disease is poor, particularly in nonEnglish-speaking ethnic minorities.

Barriers to engagement in self-management include patient factors such as language and culture, health and socioeconomic status, along with health system factors, including the attitudes and cultural competencies of health professionals toward ethnic minorities and its influence on patient health literacy.

To improve the engagement of ethnically diverse populations in chronic respiratory disease self-management, health professionals need to improve access to appropriately designed interventions through the personalization of program content and foster patient commitment through a robust health professional-patient alliance.

INTRODUCTION

Chronic respiratory disease (CRD) is one of the leading causes of death and disability in the world and includes people across all cultural and ethnic profiles [1]. Self-management, a crucial component of managing CRDs, is dependent on a robust partnership between patients and health professionals, and demonstrates positive outcomes in healthcare utilization, respiratory symptoms, and quality of life [2, 3]. However, despite the reported benefits of CRD self-management, patient engagement in this intervention is generally low [4]. Barriers to engagement in self-management strategies have been widely described in the literature [4–6] and include the lack of belief in program effect and poor access to programs [7]. People from diverse communities, particularly from nonEnglish-speaking backgrounds, make up a sizeable proportion of people living with CRDs worldwide [8], yet they are often excluded in the literature. In this review article, we discuss the factors that influence engagement in self-management interventions among people with CRD and explore the additional challenges to participation in these interventions faced by people from diverse populations. Finally, we will discuss how to improve engagement with diverse populations in pulmonary-related self-management strategies. This article is based on previous studies and contains no studies with human participants or animals performed by any authors.

EVIDENCE FOR SELF-MANAGEMENT AND CRD

Self-management interventions are a crucial component of the care continuum for people living with CRD, where healthcare professionals educate patients to improve their skills and confidence to manage their disease [9]. Common self-management interventions include education on self-recognition and treatment of disease exacerbations, smoking cessation activities, and pulmonary rehabilitation programs where both exercise prescription and advice about managing the symptoms of the disease are provided [10–12]. Reduced hospital admissions, improvements in self-efficacy to manage the disease, and increased health-related quality of life (HRQoL) are some of the reported benefits of CRD self-management interventions [3, 13, 14]. These findings were supported by an umbrella review that examined the effectiveness and efficacy of self-management interventions in asthma patients across 27 systematic reviews [15]. The review found that self-management interventions were associated with a decline in hospital admissions and an increase in HRQoL.

Furthermore, self-management programs have also shown positive effects on psychological status, which is a salient outcome for people with CRD who often experience anxiety and depression associated with disease-related activity limitations [4, 6, 16]. Although the literature highlights that self-management interventions are advantageous for improvements in HRQoL and patient control of the disease, engaging people in these interventions is a challenge [17, 18].

FACTORS INFLUENCING ENGAGEMENT IN SELF-MANAGEMENT INTERVENTIONS FOR PEOPLE WITH CRD

Patient and health system barriers to self-management in people with CRDs have been widely explored in the literature [4–6, 19] (see Fig. 1).

Figure 1 represents some recurring factors in the literature influencing self-management among patients with CRD. Patients' personal contextual factors such as language and cultural background, illness perceptions, socioeconomic status, and health status may influence their attainment of the health literacy required to engage in self-management [4–6, 19–23]. Therefore, health professionals must demonstrate prudence in the approach to self-management recommendations by integrating the socio–cultural patient context with the biomedical management of their CRD profiles [20]. An exclusively biomedical approach to care that neglects personal contextual factors compromises the integrity of the health professional–patient relationship, reducing the trustworthiness and application of the therapeutic guidance provided [20, 24, 25]. Similarly, the therapeutic environment informed by health professionals' attitudes, cultural

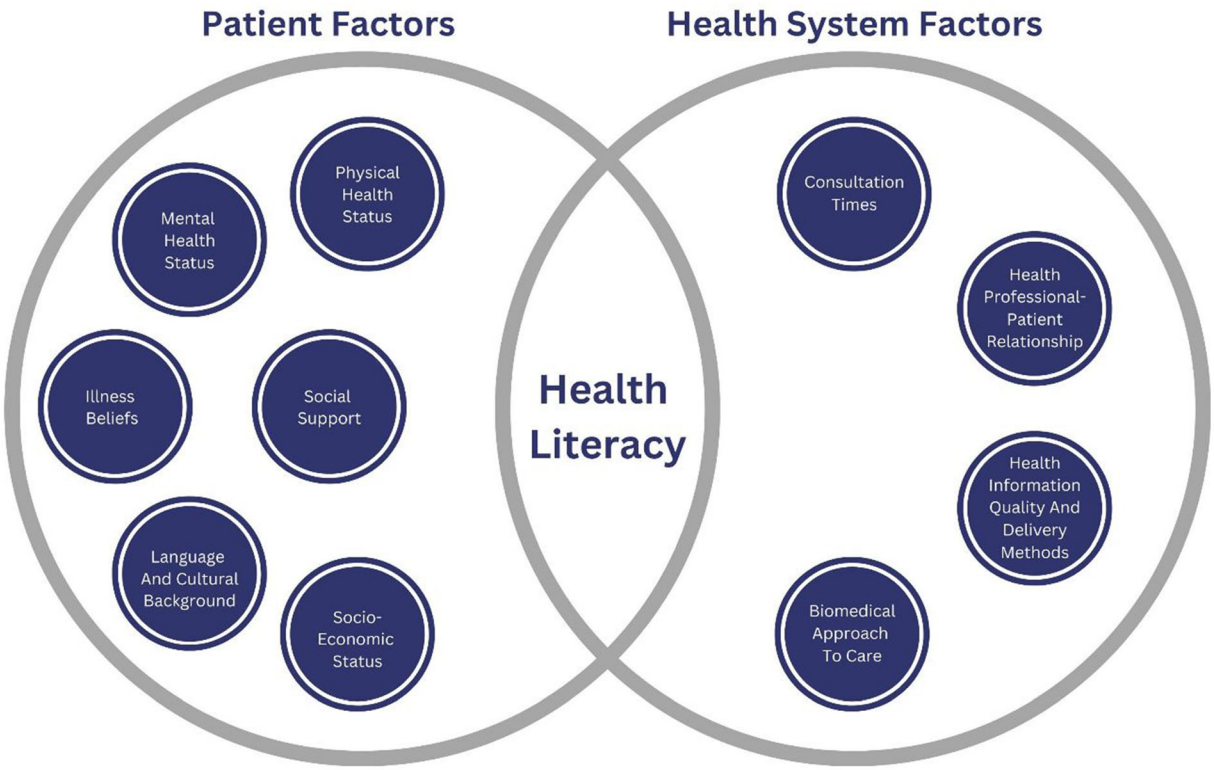

Fig. 1 Factors influencing self-management among patients with CRD. In the Venn diagram, the left circle represents patient factors, while the right circle represents health system factors that influence self-management among patients with CRD

competencies, and quality of care delivery during a consultation substantially influence patients' receptiveness and responsiveness to the health information conferred, either impeding or facilitating their health literacy for self-management [5, 20, 21, 25].

Health literacy, a central tenet of competent self-management in chronic respiratory disease [20, 21] informs health behavior and the utilization of healthcare services [22]. Hence, health literacy is the ability to understand and then apply health information. A health-literate individual is able to exercise motivation and demonstrate the skill required to navigate the health system and take control of their condition [9, 11, 23].

People from ethnic minority groups, especially those from migrant and refugee backgrounds, may experience significant difficulty acquiring health literacy since they are often faced with the challenges of navigating a dissimilar language, culture, and context [23, 24]. Macipe Costa and Gimeno Feliu [24] accentuate that although migrants have physically moved from the health culture/system in their countries of origin, they have not necessarily discarded it. Hence, navigating an alternative health system in the host country, often with limited understanding of it, may lead to socio–cultural mistrust and health information adherence challenges. An example of this was demonstrated in a recent Canadian study of self-management in Chinese and Punjabi asthma patients [25]. The study highlighted significant under-dosing of inhaler therapy among Chinese patients due to suspicions that adherence to the prescribed dosage would result in untoward medication dependence. This study also found that these patients expressed notable fears regarding the use of steroidal therapy [25]. It is the duty of health professionals to ensure that patients understand the indications, actions, and side effects of their prescribed therapy, and in so doing, opportunities may arise to demystify therapeutic suspicions and hence foster health literacy. Furthermore, the need for health professionals to be more conscious of patient-specific cultural theories or concerns in CRD self-management interventions is apparent [20, 25] as the prevalence of ethnic minority groups are rapidly increasing globally.

DIVERSITY AMONG PEOPLE LIVING WITH CRD

The number of people in the world diagnosed with CRD has risen by nearly 545 million, an increase of 39.8% since 1990 [26]. While the prevalence of CRD continues to rise across all regions of the world, case rates are rising faster in some regions than others [8] Using chronic obstructive pulmonary disease (COPD) as an example, the prevalence was consistently higher in low–middle-income countries as compared with high-income countries across all regions of the world [8]. The top ten countries with the most COPD cases, such as China, India, and Indonesia accounted for 65.2% of global COPD cases in 2019 [8]. However, the latest migration figures in the UK, the USA, and Australia demonstrate that people from China and India consistently comprise a sizeable proportion of migrants in these countries [27].

While ethnic minority groups may comprise smaller populations in some countries, the health disparities between ethnic minorities and people from predominant culture groups remain wide [28]. These inequities subsequently increase the burden on the healthcare system [28, 29]. For example, in the USA, health outcomes after COVID-19 infection were disproportionately worse among Latin populations, with a higher mortality rate and a more significant reduction in life expectancy than in White populations [30]. The need to direct health resources and further research to improve health outcomes for people from diverse populations has been emphasized in literature reviews and government reports [29, 31, 32]. A focus on health literacy among ethnic minority groups should be a first step toward reducing health inequalities and improving health outcomes.

The attainment of health literacy to execute self-management practices among ethnic minorities is not only challenged by culture and language but by religious orientation, socioeconomic status, social support structures, and

the clinical/therapeutic environment [21, 23, 33, 34]. Therefore, health professionals must consider the direct and indirect influencers of health literacy when designing interventions to improve self-management. While fitting interventions are hard to come by, there may be preliminary evidence to support the use of some strategies in improving engagement with self-management interventions among people from ethnic minority groups.

STRATEGIES TO IMPROVE ENGAGEMENT WITH SELF-MANAGEMENT INTERVENTIONS FOR ETHNIC MINORITIES

Table 1 presents a summary of the problems identified in the literature and the recommended strategies to improve engagement with self-management interventions for ethnic minorities.

According to Higgins et al. [35], patient engagement is both a process and behavior. For patients to engage in health interventions, they must have the desire and capability to actively participate in ways best suited to their needs. Health professionals must consider addressing these four defining attributes to improve engagement: personalization, access, commitment, and therapeutic alliance when engaging ethnic minorities in self-management interventions [35].

Personalization

For people from diverse populations, the need for personalized intervention includes considering the cultural and linguistic needs of the community for which the intervention is targeted. This may be implemented by translating health material into an individual's preferred language or ensuring the availability of an interpreter to assist with communication challenges [36, 37]. Addressing linguistic needs will aim to improve health access and quality of consultation. However, these methods alone are insufficient for the personalization of interventions. To engage people from diverse communities more fully, deliberate attempts to recognize and integrate cultural values into individual self-management interventions must be made [35–37]. Culture represents a coordinated system of shared meaning and includes religious beliefs, socially accepted norms, and traditions that define who people are, how they interact with the world, and how they behave [38]. Therefore, understanding an individual's cultural orientation may offer significant insights to health professionals regarding patient motivation and health behavior. Illness perception, medication adherence, physical activity, and health-seeking behavior can all be influenced by cultural norms and beliefs [22, 39, 40]. A study that explored the self-care experiences of patients with COPD in Pakistan found that spiritual, cultural, and traditional beliefs informed their illness perceptions and health behavior in the management of COPD. In this study, robust family support systems were decidedly crucial to the health of people living with COPD, and self-management intervention included integrating their traditional treatments with prescribed care [40]. Health professionals should harness cultural values (e.g., family support) to promote self-management in these patients.

Since cultural beliefs provide a framework for conduct in general and health behavior among migrant people, the maintenance of cultural identity is central to their sense of comfort and belonging [41, 42]. A qualitative study in Taiwan highlighted the tendency for Chinese/Taiwanese patients with COPD to trust cultural remedies, such as massage with red-flower oil as the first line of treatment when dyspneic [39]. The study emphasized that although the participants trusted health professionals' advice, their instinct to lean on their cultural beliefs was clear. If health professionals show interest in patients' cultural orientation and are more aware of these practices, they may have the opportunity to negotiate ways in which cultural practices may be safely integrated into usual care.

To construct culturally appropriate interventions, health professionals must involve people within the target cultural group when designing strategies to promote engagement.

Table 1 Summary of recommendations to improve engagement of diverse patients in CRD self-management interventions

Area identified for improvement	Proposed strategy
Health professional cultural competence	Health institutions should attempt to match the demographics of employees with the patient population that they serve [5, 46]
	Engagement in cultural competency training for health professionals especially in multicultural countries should be mandatory [5, 54, 55]
	Health institutions should employ interpreters who are culturally sensitive and professionally aware of the need for specificity of exchanged health professional–patient information [5, 36, 46]
	Health professionals should engage in culturally interviewing patients during consultation to gain awareness of the patient and their context. Assess/identify context-specific issues that may influence health literacy and self-management such as illness beliefs, cultural/religious orientation, level of education/literacy skills, social support, etc. [5, 21]
	Tailor care plans to integrate culture and traditional norms into self-management [40, 42]
Healthcare professionals' attitudes towards patients from ethnic minorities	The literature demonstrates that health professionals' attitude toward people from ethnic minorities is a strong determinant of patient engagement with the health advice received [21, 25, 36, 55]. Patient evaluation of consultation should be considered by healthcare institutions to gauge health professional attitudes for perceived discrimination, empathy, and willingness to address patient concerns
Access to health information and services for patients from an ethnic minority group	The provision of health information should be culturally sensitive and available in multiple forms/modes (information booklets, internet services, and audiovisual material) and languages appropriate for the patient population [5, 36, 37]
	Increasing consultation time to improve patient–health professional communication and access to desired information has been cited as a focal concern by many CRD patients [5, 20, 21]
	Health professionals should speak in plain language rather than using medical jargon during clinical encounters [5, 21, 46]
	CRD action plans should be based on standard guidelines (to avoid information conflict between health professionals) but culturally tailored and provided to every patient in a language that they understand [21, 46]
	Patients should be expected to rehearse/recite/demonstrate the information provided to them. An option to invite family/friend support should be offered during clinical encounters to promote patient accountability and execution of directives/advice [20, 21, 25]
	Utilization of patient buddy systems or natural helpers where patients from the same cultural background with greater health literacy and self-management skill volunteer to encourage and mentor others has demonstrated positive outcomes [49, 50]. Community healthcare workers may be effectively employed in the same way
	Health professionals must strategically raise awareness of the availability of self-management programs and the means by which people from diverse communities can access them [18, 19]

Table 1 continued

Area identified for improvement	Proposed strategy
Health literacy levels among ethnic minorities	Regular supervised self-management strategies yield the best outcomes [13], hence patients should be offered regular review of their understanding of and adherence to health information. Culturally sensitive, validated health literacy questionnaires may be useful tools to evaluate health literacy in diverse populations [21]
Empowering ethnic minorities to be more involved in the development of future strategies	Future mixed-method studies among diverse patients with CRD (and perhaps their families) are required to appreciate this population's needs and limitations to fully inform robust self-management strategies for CRDs in the future [43, 44]

Apart from getting people in the community involved in providing feedback on the intervention, researchers have successfully utilized experience-based co-design methods to develop and implement culturally sensitive and appropriate interventions [43, 44]. One example was an integrated model of care for delivering self-management intervention to multimorbid COPD people in rural Nepal by Yadav et al. [44]. A co-design methodology in collaboration with community workers, families, primary care practitioners, academics, and policymakers was used to develop this model. The study found that this integrated approach was feasible and more acceptable to the people, which improved engagement with the program.

Access

Further to language assistance in delivering health information, raising awareness of the availability of self-management programs and the means by which people from diverse communities can access them is crucial to engagement. Studies by Tang et al. [18] and Candy et al. [19] have shown that people from culturally and linguistically diverse communities are rarely aware of the existence of self-management interventions. Targeted promotion of these interventions in these communities is important to raise awareness that may improve their engagement with the intervention [18, 19]. Engagement may also be enhanced by designing interventions that aim to bridge the distrust that ethnic minorities may have regarding Western medicine and bust myths about the causes of chronic respiratory diseases. Concerns over suspicion towards Western medicine by people from ethnic minority groups can be evident in several studies [45–47]. The study by Alzayer et al. [46] described that people from Punjabi backgrounds were often embarrassed about public inhaler use because they believed that asthma is a communicable disease like tuberculosis [45]. Again, this study highlights the importance of health professionals understanding the presiding cultural beliefs of an individual or community to address them with appropriate education to promote access to and utilization of the treatment that they need.

Commitment

Commitment refers to the cognitive and emotional factors that empower people to use the health resources that are available to them [35, 48]. Commitment needs to be demonstrated by the user over time, and may be stimulated through social support and intellectual resources to encourage behavior changes toward improving the individual's health status [35]. An example of commitment in chronic disease management is the use of health coaching for people with diabetes, where the health professional plays the role of a coach to

facilitate the individual in developing strategies to manage their chronic illness rather than telling the individual what to do [48].

For people from diverse backgrounds, the individual's commitment to self-management intervention may be prompted by bilingual community-based health workers, 'peers,' or 'natural helpers' [49, 50]. Natural helpers are people who share the same chronic disease and cultural beliefs as the targeted individual and assist them as peers to keep them motivated in the program. While there have yet to be any studies evaluating the effectiveness of natural helpers in supporting people through self-management interventions in CRD, a meta-analysis of randomized controlled trials in people with type 2 diabetes found that natural helper intervention significantly reduces glycated hemoglobin (HbA1C) levels among people with natural helper interventions as compared with controls [51]. These findings highlight the effectiveness of using others who share similar disease journeys and cultural beliefs to support each other's commitment through a self-management intervention.

Therapeutic Alliance

Therapeutic alliance refers to the relationship between health professionals and the patient [25, 35], which encompasses the quality of the medical interaction and how well the health professional can communicate and build rapport with the patient. Building rapport with people from culturally and linguistically diverse communities can be challenging, especially if the individual has experienced previous unpleasant interactions with health professionals that diminished their trust towards them [25]. Using the study by Shum et al. [25] as an example, people with CRD from diverse backgrounds in Canada expressed their disappointment at the lack of integration of cultural aspects into their respiratory care. They described the doctor–patient interaction as culturally reductionist and disregarding. The participants further articulated their disappointment at the exclusion of their family members during their consultation, as many people from diverse populations value family as social capital in their healthcare [40]. Participants in this study also lamented that the lack of cultural representation among health professionals left them feeling isolated in their clinical encounters and for lack of understanding, they held their doctors responsible for their poor health literacy. Similar sentiments were conferred in the findings of Alzayer et al. [46], where pharmacists agreed that many diverse patients with asthma could not properly self-manage as they were often without any written action plans provided to them by their doctors in a language that they could understand.

To deliver culturally appropriate services to patients from diverse backgrounds, health professionals need training in cultural competencies to foster a culturally safe environment for their patients [52–55]. However, cultural competence training is lacking in clinical practice [53, 54] and adversely influences people living with CRD to engage in self-management [25, 46, 55]. Levack et al. [55] described reluctance to engage in pulmonary rehabilitation among people from Maori backgrounds when they perceived a lack of meaningful cultural integration and safety during program delivery.

Attaining cultural competence to ensure cultural safety requires training to enhance cultural knowledge, sensitivity, and skill to positively shift health professionals' attitudes toward ethnic minorities and to improve quality and equity of care [52, 53]. This concept complements the fundamental patient-centered care ideal, which beckons healthcare providers to enter the patient's world to see their health condition within their patient-specific context [52]. The approach aims to improve the quality of patient care and promote respectful health professional–patient relations, while reducing the likelihood of discrimination and care inequity [53].

Health professionals must demonstrate genuine patient responsiveness to strengthen the health professional–patient liaison [52] and establish a partnership in designing sustainable CRD self-management interventions that meet the medical and contextual needs of culturally and linguistically diverse patients [44, 55].

CONCLUSIONS

While the importance of self-management interventions for CRD is becoming more widely recognized, migrants from backgrounds dissimilar to the host country are less likely to engage in these health services, often due to a lack of cultural and linguistic appropriation of program delivery. Despite comprising a small proportion of the general population, the barriers to overcoming these disparities in healthcare delivery for ethnic minorities have been inadequately addressed. Strategies to implement culturally and linguistically responsive interventions have been developed but appear to be poorly applied, hence the literature illustrates the need for health professionals' commitment to improving access to and engagement in culturally tailored CRD self-management interventions among people from diverse populations.

ACKNOWLEDGEMENTS

Funding. No funding or sponsorship was received for the publication of this article.

Author Contributions. All named authors met the International Committee of Medical Journal Editors (ICMJE) criteria for authorship for this article, take responsibility for the integrity of the work as a whole, and have given their approval for this version to be published.

Disclosure. Stacy Maddocks, Pat Camp and Clarice Tang declare that they have no competing interest.

Compliance with Ethics Guidelines. This article is based on previously conducted studies and does not contain any new studies with human participants or animals performed by any of the authors.

REFERENCES

1. Soriano JB, Kendrick PJ, Paulson KR, Gupta V, Abrams EM, Adedoyin RA, et al. Prevalence and attributable health burden of chronic respiratory diseases, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. Lancet Respir Med. 2020;8(6):585–96.

2. Zwerink M, Brusse-Keizer M, van der Valk PD, Zielhuis GA, Monninkhof EM, van der Palen J, et al. Self management for patients with chronic obstructive pulmonary disease. Cochrane Database Syst Rev [Internet]. 2014 [cited 2022 Oct 3];(3). https://doi.org/10.1002/14651858.CD002990.pub3/full.

3. Schrijver J, Lenferink A, Brusse-Keizer M, Zwerink M, van der Valk PD, van der Palen J, et al. Self-management interventions for people with chronic obstructive pulmonary disease. Cochrane Database Syst Rev [Internet]. 2022 [cited 2022 Oct 3];(1). https://doi.org/10.1002/14651858.CD002990.pub4/abstract.

4. Miles C, Arden-Close E, Thomas M, Bruton A, Yardley L, Hankins M, et al. Barriers and facilitators of effective self-management in asthma: systematic review and thematic synthesis of patient and healthcare professional views. Npj Prim Care Respir Med. 2017;27(1):1–21.

5. Komaric N, Bedford S, van Driel ML. Two sides of the coin: patient and provider perceptions of health care delivery to patients from culturally and linguistically diverse backgrounds. BMC Health Serv Res. 2012;12(1):322.

6. Disler RT, Gallagher RD, Davidson PM. Factors influencing self-management in chronic obstructive pulmonary disease: an integrative review. Int J Nurs Stud. 2012;49(2):230–42.

7. Cox NS, Oliveira CC, Lahham A, Holland AE. Pulmonary rehabilitation referral and participation are commonly influenced by environment, knowledge, and beliefs about consequences: a systematic review using the Theoretical Domains Framework. J Physiother. 2017;63(2):84–93.

8. Adeloye D, Song P, Zhu Y, Campbell H, Sheikh A, Rudan I. Global, regional, and national prevalence of, and risk factors for, chronic obstructive pulmonary disease (COPD) in 2019: a systematic review and modelling analysis. Lancet Respir Med. 2022;10(5):447–58.

9. Grady PA, Gough LL. Self-management: a comprehensive approach to management of chronic conditions. Am J Public Health. 2014;104(8):e25-31.

10. Bourbeau J, Nault D, Dang-Tan T. Self-management and behaviour modification in COPD. Patient Educ Couns. 2004;52(3):271–7.

11. Effing TW, Vercoulen JH, Bourbeau J, Trappenburg J, Lenferink A, Cafarella P, et al. Definition of a COPD self-management intervention: International Expert Group consensus. Eur Respir J. 2016;48(1):46–54.

12. Effing T, Monninkhof EE, van der Valk PPDLPM, Zielhuis GG, Walters EH, van der Palen JJ, et al. Self-management education for patients with chronic obstructive pulmonary disease. Cochrane Database Syst Rev [Internet]. 2007 [cited 2022 Oct 3];(4). https://doi.org/10.1002/14651858.CD002990.pub2/abstract.

13. Murphy LA, Harrington P, Taylor SJ, Teljeur C, Smith SM, Pinnock H, et al. Clinical-effectiveness of self-management interventions in chronic obstructive pulmonary disease: an overview of reviews. Chron Respir Dis. 2017;14(3):276–88.

14. Kneale D, Harris K, McDonald VM, Thomas J, Grigg J. Effectiveness of school-based self-management interventions for asthma among children and adolescents: findings from a Cochrane systematic review and meta-analysis. Thorax. 2019;74(5):432–8.

15. Pinnock H, Parke HL, Panagioti M, Daines L, Pearce G, Epiphaniou E, et al. Systematic meta-review of supported self-management for asthma: a healthcare perspective. BMC Med. 2017;15(1):64.

16. Farmer A, Williams V, Velardo C, Shah SA, Yu LM, Rutter H, et al. Self-management support using a digital health system compared with usual care for chronic obstructive pulmonary disease: randomized controlled trial. J Med Internet Res. 2017;19(5):e7116.

17. Tang CY, Lavercombe M, Southcott AM, Taylor NF, Blackstock FC. Access to pulmonary rehabilitation for people from culturally and linguistically diverse communities: a cohort study. Health Soc Care Community. 2022;30(6):e4133–e4143.

18. Candy S, Jepsen N, Coomarasamy C, Curry J, Dodson G, Pomelile J, et al. Patient characteristics and predictors of completion of a pulmonary rehabilitation programme in Auckland, New Zealand. N Z Med J. 2020;133(1522):30–41.

19. Russell S, Ogunbayo OJ, Newham JJ, Heslop-Marshall K, Netts P, Hanratty B, et al. Qualitative systematic review of barriers and facilitators to self-management of chronic obstructive pulmonary disease: views of patients and healthcare professionals. Npj Prim Care Respir Med. 2018;28(1):2.

20. Poureslami I, Shum J, Goldstein R, Gupta S, Aaron SD, Lavoie KL, et al. Asthma and COPD patients' perceived link between health literacy core domains and self-management of their condition. Patient Educ Couns. 2020;103(7):1415–21.

21. van der Heide I, Poureslami I, Shum J, Goldstein R, Gupta S, Aaron S, et al. Factors Affecting Health Literacy as Related to Asthma and COPD Management: Learning from Patient and Health Care Professional Viewpoints. HLRP Health Lit Res Pract [Internet]. 2021 [cited 2022 Aug 8];5(3). https://doi.org/10.3928/24748307-20210526-01.

22. Shaw SJ, Huebner C, Armin J, Orzech K, Vivian J. The role of culture in health literacy and chronic disease screening and management. J Immigr Minor Health. 2009;11(6):460–7.

23. Sørensen K, Van den Broucke S, Fullam J, Doyle G, Pelikan J, Slonska Z, et al. Health literacy and public health: a systematic review and integration of definitions and models. BMC Public Health. 2012;12(1):80.

24. Macipe Costa RM, Gimeno Feliu LA. Competencia cultural y población inmigrante: un reto cotidiano en nuestras consultas. Pediatría Atención Primaria. 2011;13(50):299–319.

25. Shum M, Poureslami I, Liu J, FitzGerald JM. Perceived barriers to asthma therapy in ethno-cultural communities: the role of culture. Beliefs and Social Support Health (N Y). 2017;09(07):1029–46.

26. Labaki WW, Han MK. Chronic respiratory diseases: a global view. Lancet Respir Med. 2020;8(6):531–3.

27. Interactive World Migration Report 2022 [Internet]. [cited 2022 Nov 22]. https://www.iom.int/wmr/interactive.Accessed 22 Nov 2022.

28. Collins JC, Rocco TS. Disparities in healthcare for racial, ethnic, and sexual minorities. New Dir Adult Contin Educ. 2014;2014(142):5–14.

29. Holguin F, Moughrabieh MA, Ojeda V, Patel SR, Peyrani P, Pinedo M, et al. Respiratory health in migrant populations: a crisis overlooked. Ann Am Thorac Soc. 2017;14(2):153–9.

30. Andrasfay T, Goldman N. Reductions in 2020 US life expectancy due to COVID-19 and the disproportionate impact on the Black and Latino populations. Proc Natl Acad Sci. 2021;118(5): e2014746118.

31. Celedón JC, Roman J, Schraufnagel DE, Thomas A, Samet J. Respiratory Health Equality in the United States. The American Thoracic Society perspective. Ann Am Thorac Soc. 2014;11(4):473–9.

32. Reiss K, Lehnhardt J, Razum O. Factors associated with smoking in immigrants from non-western to western countries—what role does acculturation play? A systematic review. Tob Induc Dis. 2015;13(1):11.

33. Kale MS, Federman AD, Krauskopf K, Wolf M, O'Conor R, Martynenko M, et al. The Association of Health Literacy with illness and medication beliefs among patients with chronic obstructive pulmonary disease. PLoS ONE. 2015;10(4): e0123937.

34. FitzGerald C, Hurst S. Implicit bias in healthcare professionals: a systematic review. BMC Med Ethics. 2017;18(1):19.

35. Higgins T, Larson E, Schnall R. Unraveling the meaning of patient engagement: a concept analysis. Patient Educ Couns. 2017;100(1):30–6.

36. Henderson S, Kendall E, Henderson S, Kendall E. Culturally and linguistically diverse peoples' knowledge of accessibility and utilisation of health services: exploring the need for improvement in health service delivery. Aust J Prim Health. 2011;17(2):195–201.

37. Poureslami I, Kwan S, Lam S, Khan NA, FitzGerald JM. Assessing the effect of culturally specific audiovisual educational interventions on attaining self-management skills for chronic obstructive pulmonary disease in Mandarin-and Cantonese-speaking patients: a randomized controlled trial. Int J Chron Obstruct Pulmon Dis. 2016;11:1811.

38. Song S. The subject of multiculturalism: culture, religion, language, ethnicity, nationality, and race? In: de Bruin B, Zurn CF, editors. New waves in political philosophy [Internet]. London: Palgrave Macmillan UK; 2009 [cited 2022 Oct 5]. p. 177–97. (New Waves in Philosophy). https://doi.org/10.1057/9780230234994_10.

39. Chen KH, Chen ML, Lee S, Cho HY, Weng LC. Self-management behaviours for patients with chronic obstructive pulmonary disease: a qualitative study. J Adv Nurs. 2008;64(6):595–604.

40. Zeb H, Younas A, Ahmed I, Ali A. Self-care experiences of Pakistani patients with COPD and the role of family in self-care: a phenomenological inquiry. Health Soc Care Community. 2021;29(5):e174–83.

41. Coyle M, Shergis JL, Liu S, Wu L, Zhang AL, Guo X, et al. Safety of Chinese herbal medicine for chronic obstructive pulmonary disease. Evid Based Complement Alternat Med. 2015;26(2015): e380678.

42. Henry Osokpo O, James R, Riegel B. Maintaining cultural identity: a systematic mixed studies review of cultural influences on the self-care of African immigrants living with non-communicable disease. J Adv Nurs. 2021;77(9):3600–17.

43. Gilbert E, Collins R, Webster V, Boyd N, Maple-Brown L, Boyle J, et al. Using co-design to develop a culturally responsive reproductive health learning resource for Aboriginal and Torres Strait Islander youth. Health Promot J Austr. 2021;32(S1):179–85.

44. Yadav UN, Lloyd J, Baral KP, Bhatta N, Mehta S, Harris MF. Using a co-design process to develop an integrated model of care for delivering self-management intervention to multi-morbid COPD people in rural Nepal. Health Res Policy Syst. 2021;19(1):17.

45. Horne R, Graupner L, Frost S, Weinman J, Wright SM, Hankins M. Medicine in a multi-cultural society: the effect of cultural background on beliefs about medications. Soc Sci Med. 2004;59(6): 1307–13.

46. Alzayer R, Svedin E, Rizvi SA, Basheti I, Chaar B, Saini B. Pharmacists' experience of asthma management in culturally and linguistically diverse (CALD) patients. Res Soc Adm Pharm. 2021;17(2): 315–25.

47. Horne R, Chapman SCE, Parham R, Freemantle N, Forbes A, Cooper V. Understanding patients' adherence-related beliefs about medicines prescribed for long-term conditions: a meta-analytic review of the necessity-concerns framework. PLoS ONE. 2013;8(12): e80633.

48. Rawal L, Sahle BW, Smith BJ, Kanda K, Owusu-Addo E, Renzaho AMN. Lifestyle interventions for type 2 diabetes management among migrants and ethnic minorities living in industrialized countries: a

systematic review and meta-analyses. BMJ Open Diabetes Res Care. 2021;9(1): e001924.

49. Kim EJ, Kim T, Paasche-Orlow MK, Rose AJ, Hanchate AD. Disparities in Hypertension Associated with Limited English Proficiency. J Gen Intern Med. 2017;32(6):632–9.

50. Cherrington A, Ayala GX, Elder JP, Arredondo EM, Fouad M, Scarinci I. Recognizing the diverse roles of community health workers in the elimination of health disparities: from paid staff to volunteers. Ethn Dis. 2010;20(2):189–94.

51. Qi L, Liu Q, Qi X, Wu N, Tang W, Xiong H. Effectiveness of peer support for improving glycaemic control in patients with type 2 diabetes: a meta-analysis of randomized controlled trials. BMC Public Health. 2015;15(1):471.

52. Saha S, Beach MC, Cooper LA. Patient centeredness, cultural competence and healthcare quality. J Natl Med Assoc. 2008;100(11):1275–85.

53. Watt K, Abbott P, Reath J. Developing cultural competence in general practitioners: an integrative review of the literature. BMC Fam Pract. 2016;17(1): 158.

54. Horvat L, et al. Cultural competence education for health professionals. Cochrane Database Syst Rev. 2014. https://doi.org/10.1002/14651858.CD009405.pub2. (**preprint**).

55. Levack WM, Jones B, Grainger R, Boland P, Brown M, Ingham TR. Whakawhanaungatanga: the importance of culturally meaningful connections to improve uptake of pulmonary rehabilitation by Māori with COPD—a qualitative study. Int J Chron Obstruct Pulmon Dis. 2016;9(11):489–501.