



Social determinants of hypertension in high-income countries: A narrative literature review and future directions

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Abstract

Hypertension is a leading cause of cardiovascular disease and despite established strategies to lower blood pressure, the control of hypertension remains poor. This is true even in high-income countries with well-established welfare and medical systems. Among the social factors associated with hypertension (i.e., social determinants of hypertension, SDHT), individual socioeconomic status (SES), including education, income, and occupation, can be crucial for hypertension management (prevalence, awareness, treatment, and control). This article reviews the findings of recently published studies that examined the association between SES and hypertension management in high-income countries. It also discusses social prescribing, which targets social isolation and loneliness as modifiable SDHT to improve hypertension management.

Keywords Hypertension · Social determinants of health · Socioeconomic status · Social prescribing

Introduction

High blood pressure (BP, hypertension) is a leading cause of cardiovascular disease. Between 1990 and 2015, the prevalence of elevated systolic BP (≥ 140 mmHg) substantially increased, and disability-adjusted life-years and deaths associated with elevated BP also increased [1]. This high prevalence of hypertension is consistent globally, regardless of a country's income status: low, middle, or high [2]. To minimize the burden of hypertension, several guidelines emphasize the management of the hypertension cascade: development (prevalence), screening (to promote awareness), treatment, and control [3–5]. The control of hypertension has generally improved in recent decades [3, 6]; however, despite the availability of low-cost and effective antihypertensive medications, the rates of

controlled hypertension remain less than 50%, even in high-income countries [2, 3].

Primordial prevention aims to avoid the establishment of social, economic, and environmental conditions that contribute to an elevated risk of disease [7, 8]. Among these conditions, social factors, particularly individual socioeconomic status (SES) measures, including educational attainment, income level, and occupation, have been repeatedly found to be associated with hypertension (i.e., social determinants of hypertension, SDHT) (Fig. 1) [2, 9, 10]. Intermediary factors of individual SES that lead to hypertension development include material circumstances (e.g., housing and healthy food availability), behavioral factors (e.g., diet, exercise, smoking, and alcohol consumption), and psychosocial factors (e.g., stressors, social isolation, and loneliness). Individual SES can also affect hypertension control via these same factors and additional behavioral factors, such as adherence to medical guidance and medication, which can be influenced by community/state-level factors such as the level of national health systems.

This article evaluated the SDHT and hypertension management cascade (prevalence/incidence, awareness, treatment, and control). It was restricted to studies in high-income countries with well-established welfare and medical systems because the effect of these factors on hypertension management was expected to vary across various levels of national medical systems. Furthermore, this review focused

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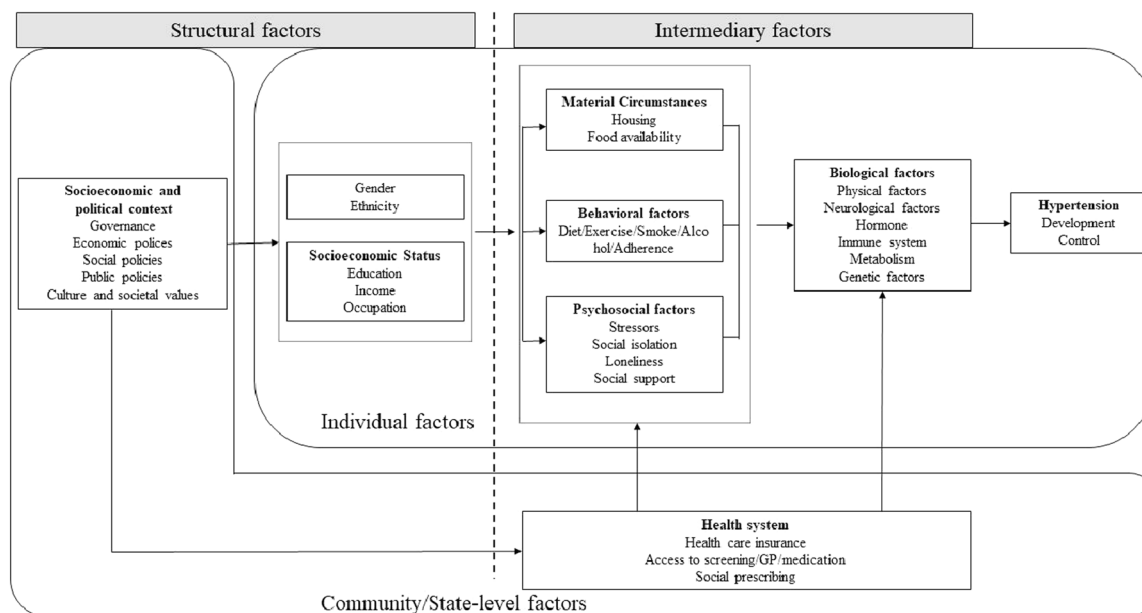
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Graphical Abstract

Conceptual framework of social determinants of hypertension



on social isolation and loneliness as modifiable SDHT to improve hypertension management from the perspective of social prescribing.

SES and hypertension

A literature review of articles published between January 2000 and June 2021 was performed via the MEDLINE database to assess the influence of SES on the prevalence/incidence, awareness, treatment, and control of hypertension in high-income countries. We included the keywords “socioeconomic factors” (MeSH) or “socioeconomic factors” and “hypertension” in the title/abstract search, and added “prevalence,” “incidence,” “awareness,” “treatment,” or “control”. The titles and abstracts of the references were screened and those that were apparently irrelevant reports were excluded. We retrieved full-text articles for the remaining references and screened them to identify studies for inclusion. Our inclusion criteria were articles written in English and studies conducted in high-income countries. The Supplementary Table presents the data on the detailed study characteristics of the included studies.

Education and hypertension

The association between education and hypertension prevalence/incidence in high-income countries is relatively

consistent [2, 11–29]. A meta-analysis, for example, reported that lower educational attainment is associated with an increased prevalence/incidence of hypertension in high-income countries (odds ratio [OR] (lowest vs. highest education level category): 1.69 [95% confidential interval: 1.49 to 1.91]) [9].

In general, the role of education in improving the awareness, treatment, and control of hypertension in high-income countries seems to be small. Several studies reported a null association between education and hypertension awareness [2, 11, 16, 21, 30–35], treatment [2, 16, 18, 32, 33, 35, 36], and control [2, 11, 15, 19, 21, 22, 30–33, 35, 37, 38]. A few studies have reported a significant but inconsistent association between education and hypertension awareness and treatment. For example, a study in South Korea reported an association between educational attainment and better awareness among women [15], while a study in Spain reported greater awareness among people with lower educational attainment [18]. Two studies conducted in Singapore [11] and South Korea [19] reported better treatment among people with high educational attainment, while three studies in Switzerland [21], Australia [39], and Japan [30] reported lower treatment among these people those. The reasons behind such inconsistent findings remain unclear. In some settings, highly educated people may think that they can manage their BP with a nonpharmacological approach or that a nonpharmacological approach might be presented more often by general practitioners (GPs). However, the associations, although only observed in a few studies in Spain [18],

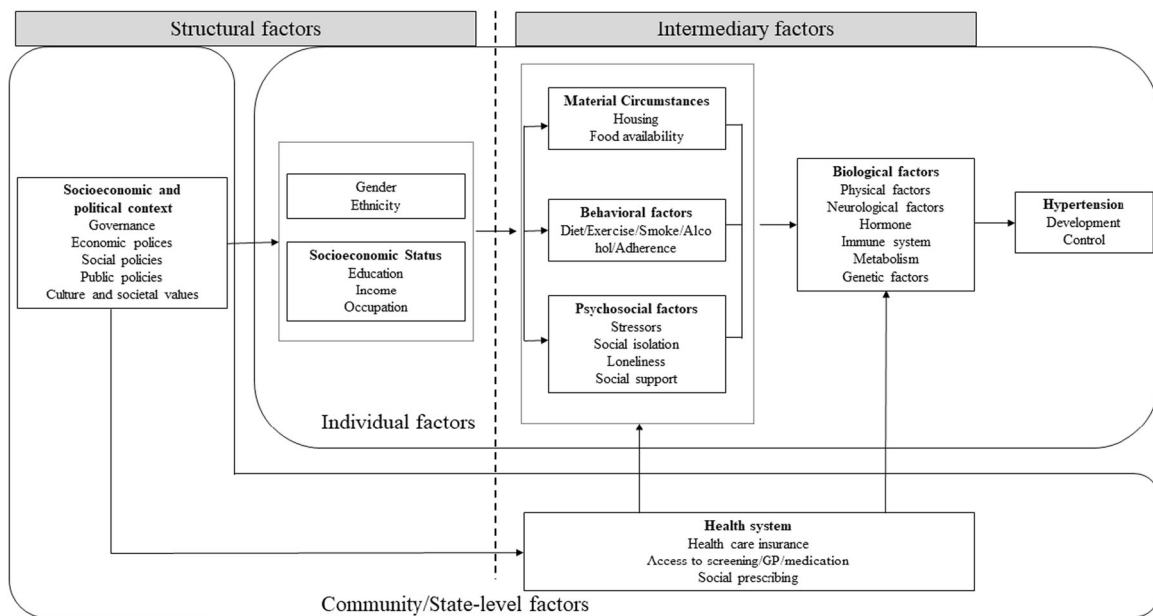


Fig. 1 Conceptual framework of social determinants of hypertension. Based on World Health Organization (2010) [10]

Austria [40], and France [41], between education and hypertension control are consistent. In some high-income countries, hypertension in people with high educational attainment might be better controlled than in those with low educational attainment.

Income and hypertension

The association between income and hypertension prevalence/incidence in high-income countries is relatively consistent [11, 12, 15, 22, 25, 42, 43]. A meta-analysis, for example, reported that lower income is associated with an increased prevalence/incidence of hypertension in high-income countries (OR (lowest vs. highest income category): 1.36 ([1.16 to 1.59]) [9].

In general, it seems that income does not play an important role in improving the awareness, treatment, and control of hypertension in high-income countries. Several studies reported a null association between income and hypertension awareness [19, 30, 32, 33, 36], treatment [19, 30, 32, 33, 36], and control [11, 15, 19, 30, 32]. Only a few studies have reported positive associations between income level and hypertension treatment (Singapore [11] and the United States [44]) and control (the United States [33, 45]). Income may improve the treatment and control of hypertension only in limited settings.

Occupation and hypertension

Although evidence for employment is relatively scarce compared to that for education and income, employment

has been associated with lower hypertension prevalence/incidence in high-income countries [14, 16, 22]. A meta-analysis, for example, indicated that a lower occupational grade is associated with an increased prevalence/incidence of hypertension in high-income countries (OR (lowest vs. highest occupational grade category): 1.63 (1.27 to 2.09)) [9].

The evidence for occupation and the awareness/treatment/control of hypertension is scarce and inconclusive. Some recent studies showed a null association between employment and hypertension awareness [11, 30], treatment [11, 19], and control [30, 37]. Meanwhile, a study in Finland [16] showed that retirement is associated with better awareness of hypertension than being employed, while a study in Scotland [35] showed that unemployment due to sickness is associated with better awareness than full-time employment. Two studies in Japan [30] and Australia [39] showed that unemployment is associated with better treatment compared to employment. A study in Finland [16] showed that retirement, but not unemployment, is associated with better treatment compared to employment. A study in Scotland [35] showed that those who are unemployed and seeking work undergo worse treatment than those with full-time jobs, while unemployment due to sickness was associated with better treatment than full-time employment. A few reports have shown null [30, 37] associations between employment and hypertension control. A study in Singapore [11] showed that retirement/unemployment was associated with better control compared to employment/studying full-time. A study in Scotland [35] showed that being a homemaker or retired was associated with worse control compared to having a full-time job.

Care should be taken while interpreting the findings in this field because the situations of people with different employment statuses cannot be described simply. For example, the notion of unemployment was defined differently in the studies mentioned above. Some studies differentiated between students, homemakers, retired people, people seeking work, and people with sickness, while others did not. Even among employed people, full-time work and part-time work differently affect the hypertension care cascade because, for example, people with full-time jobs have less time to visit their general practitioner than people with part-time jobs and those who do not work.

Future directions

In high-income countries, individuals with high SES, such as those with high educational attainment, high income, and employment, are consistently associated with a low prevalence of hypertension. Several pathways can be identified, such as disparities in material circumstances, health behaviors (e.g., due to less health literacy, learned effectiveness, and personal control) [46, 47], and psychological stressors (i.e., due to a low problem-solving ability) [48, 49] between people with high and low SES. Closing the SES gap, as a long-term strategy, and/or reducing disparities in intermediary factors of SDHT between people with high and low SES are potential approaches to reduce disparities in hypertension prevalence in high-income countries.

However, SES is not likely to play an important role in hypertension control. This is probably because once established welfare and health care systems are achieved, these factors do not considerably change the accessibility to medical care or the affordability of antihypertensive drugs in contrast to their expected changes in low-income countries where health systems are often weak. In this context, closing the gap in SES is not considered a promising approach to improve hypertension control.

Targeting modifiable intermediary factors of SDHT: Social prescribing

A possible target of SDHT is a modifiable intermediary factor. Social prescribing, which is “a way of linking patients in primary care with sources of support within the community [50],” can be an approach to improve some psychosocial factors, such as social isolation (the objective state of having few social connections with others) and loneliness (a subjective feeling of being isolated) [51, 52]. In response to increasing concerns about the societal and health impacts of social isolation and loneliness [53, 54], some countries, such as the UK and Japan, have recently appointed “ministers of loneliness”.

Social isolation/loneliness and hypertension

Although evidence is limited, a few studies have reported the prevalence of an association between hypertension and social isolation, as well as loneliness and elevated BP in the U.S [55, 56]. Possible mechanisms by which social isolation and loneliness influence BP levels and hypertension control are psychological stress [57] and social contagion: [58] behaviors spread in a social network through the diffusion of information or the transmission of behavioral norms. Health-related behaviors, such as physical activity, smoking, and medication adherence, can be adversely affected in the case of socially isolated people with a small social network [54, 59]. However, little is known about how social isolation and loneliness are related to the awareness, treatment, and control of hypertension.

Social prescribing for hypertension

A systematic review suggested that the current evidence is insufficient to demonstrate definitive guidance for social prescribing [50]. There is little evidence for hypertension; however, some studies that focused on social participation suggest the potential of social prescribing in hypertension care. A cross-sectional study and a longitudinal study in Japan, for example, reported the association of membership in social organizations with a lower prevalence of hypertension [60, 61]. A multilevel analysis showed a lower prevalence of hypertension among people in communities with high proportions of people participating in social organizations, suggesting a spillover effect of social participation on hypertension: [62] hypertension might be prevented only by living in communities that are rich in social participation.

A study in Sweden reported that low social participation is associated with low adherence to antihypertensive medication [63]. Although a cross-national analysis showed that membership in social organizations was associated with control in lower-middle-income/low-income countries but not in high-income/upper-middle-income countries [64], a recent study in Japan showed an association between social participation and better control of hypertension among older people [65].

Future directions

The role of social prescribing in improving hypertension control is inconclusive. However, the lack of robust evidence does not necessarily mean that social prescribing is ineffective. Future studies should address the complex issue of social prescribing. Furthermore, wide variations in the nature of the interventions are required [51].

Face-to-face social interaction, which is supposed to be prescribed in social prescribing, can be restricted in specific

settings, such as the ongoing COVID-19 pandemic. Social connections on the internet are a possible alternative to face-to-face social interactions in this case. The use of the internet for communication, for example, has been related to fewer feelings of loneliness [66] and the onset of depression [67], suggesting a simultaneous BP-lowering effect among people who use the internet to communicate. Although this remains unclear, social contagion might also be observed in online social connections where health-related behaviors, such as physical activity, smoking, and medication adherence, can be altered. Future studies should examine the role of online social connections in hypertension control as a new resource that is referred to in social prescribing.

Conclusion

Determinants of hypertension and its care are diverse and often interconnected; therefore, holistic and comprehensive approaches are required. This article highlighted the contribution of the SDHT in high-income countries. The SDHT are a crucial factor in understanding the dynamics of hypertension. Future studies should examine whether intervening in SDHT is effective in reducing hypertension prevalence and achieving optimal hypertension control. Particularly, social prescribing, which involves referring people to community resources to reduce social isolation and loneliness via face-to-face and online connections, has the potential to improve hypertension control.

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Compliance with ethical standards

Conflict of interest The authors declare no competing interests.

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