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Original Article

Interventions to Increase Physical Activity in an Urban Setting in Low- and Middle-Income Countries: a Systematic Review

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Abstract

Physical inactivity is a global public health concern and the fourth leading risk factor for non-communicable diseases. Being physically inactive is common behaviors in rapid urbanization. Studies investigating the interventions to increase physical activity in urban settings have increased rapidly, however, knowledge in low- and middle-income countries (LMICs) is still lacking. This systematic review investigates the interventions to increase physical activity in an urban setting of LMICs. The review was conducted following the PRISMA guidelines through three electronic databases: PubMed, Scopus, and Google Scholar. The search was restricted to English-language papers published between January 2016 and June 2021. Of 1,276 articles, 12 studies carried out from four regions were included in the study. The majority came from Asia (6 articles), followed by South America (5 articles). The majority adopted a cross-sectional design. Recreational space interventions (particularly green-space provision and design) were the most common across studies (5), followed by health promotion interventions (3), neighborhood interventions (3), and transportation interventions (1). Nine out of 12 interventions were significantly related to higher physical activity across LMICs. Policymakers may apply and implement these interventions in their contexts where appropriate.

Keywords: physical activity; interventions; low- and middle-income countries; urban; systematic review

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Introduction

The World Health Organization (WHO) has defined physical activity as any bodily movements throughout the day, mainly in work, transport and recreation domains.[1] Sufficient physical activity for adults (aged 18 and above) was recommended at least 150 minutes for moderate physical activity or at least 75 minutes for vigorous physical activity per week[1] and for children at least 60 minutes

per day. Physical inactivity is an increasing global public health concern as the fourth leading risk factor for many non-communicable diseases (NCDs), including obesity, diabetes, cardiovascular disease, stroke, cancers, and mental health problems.[2] Worldwide, approximately 3.2 million deaths are attributed to insufficient physical activity annually reported by the WHO in 2014.[2] Low- and middle-income countries (LMICs) carry a disproportionate share of the disease burden[3,4], and approximately 82% of global NCD deaths take place in LMICs.[5] Global insufficient physical activity is estimated at 23% in adults and 91% in adolescents.[2] In rapid urbanization, the problem of physical inactivity is growing as urban residents have more sedentary lifestyles.[6] The United Nations has estimated that urban populations will double from 30% in 1950 to 68% or around 6.7 billion people by 2050.[7]

In terms of policy responding to rapid urbanization and the burden of physical inactivity, global leaders had committed to the United Nations Sustainable Development Goals 11, inter alia, to strengthen inclusive, safe, resilient and sustainable cities. Interventions to promote active cities are important to leverage physical inactivity problems.[8] In addition, member states of the World Health Organization adopted the Global Action Plan on Physical Activity (2018-2030) in the 71st World Health Assembly in 2018 with the aim to reduce the global prevalence of inadequate physical activity by 15% by 2030.[9] This call for a whole-of-society response to create social, cultural, economic and environment which are conducive to physical activity as an active lifestyle is intrinsically related to the design of the city, physical and social environment.[9]

The global academic sector also responds to the crisis of physical inactivity. Research investigating the characteristics of effective physical activity interventions in urban settings has increased rapidly over the last two decades. A cross-sectional study investigated relationships between physical activity in 6,822 adults who lived in urban environments in 14 cities in 10 countries.[10] The study found associations between active-friendly neighborhood environments and physical activity. The net residential density, intersection density, public transport density, and number of parks were significantly, positively, and linearly related to physical activity. Another study using critical and systematic reviews identified interventions to promote active transport in cities.[11] The interventions were destination accessibility, managing demand by reducing the availability and increasing the cost of parking, designing pedestrian-friendly and cycling-friendly movement networks, achieving optimum levels of residential density, redcuing the distance to public transport, and ehancing the desirability of active travel modes such as creating safe attractive neighborhoods and safe, affordable, and convenient public transport. In addition, a systematic review of 57 scoping reviews suggested that physical activity in cities can be promoted through multi-level interventions.[12] Reviews fell into four main categories: (1) setting and target group-specific, (2) urban design, environment, and transport, (3) economic instruments, and (4) broad-range perspective. Results indicate that there is solid evidence for policy effectiveness in some areas such as school-based and infrastructural policies but that the evidence in other areas is insufficient especially for economic policies.

Despite the well-documented benefits of physical activity interventions, there is a knowledge gap in interventions to increase physical activity in an urban setting in LMICs. The most recent systematic review relevant to this topic in LMICs was conducted by Elshahat et al. in 2020.[13] The study found that land-use mix diversity was positively associated with transport physical activity and the presence of recreation facilities resulted in an increase in physical activity during leisure time. Moreover, increased safety from crime at night consistently increased total physical activity and walking levels. However, the study only focuses on built environment correlates of physical activity in LMICs, not broader interventions to increase physical activity and is not specific to an urban setting. Therefore, this systematic review aims to investigate the interventions to increase physical activity in an urban setting from LMICs, to inform policymakers in developing countries towards physical activity policy design in a city setting.

Method

This systematic review was registered in the International Prospective Register of Systematic Reviews (PROSPERO) (Registration CRD42021270673).

Search Strategy

This review was conducted following the PRISMA guidelines for reporting systematic reviews.[14,15] Various search terms and phrases were selected to reflect the key concepts of the review (physical activity, intervention, urban or city, low- and middle-income countries or developing countries, effective), and combined using Boolean operators AND. Three electronic databases were searched: PubMed, Scopus, and Google Scholar. The search was limited to human studies and restricted to English language papers published between January 2016 and June 2021 to summarize contemporaneous literature in the past five years.

Study Selection

Studies were considered for inclusion only if they were conducted in LMICs, according to the World Bank classification list.[16] The included studies investigated the association between objectively and/or subjectively measured physical activity intervention and outcome. All physical activity domains across all age groups of the general population were included. The primary study design was eligible. Studies investigating the physical activity outcomes without any interventions were excluded. As demonstrated in Table 1.

Table 1 Study criteria

	Inclusion criteria	Exclusion criteria
Population	General population. All age groups.	Disease-specific population. Minority, ethnic, athlete, disabilities, or special groups.

Table 1 Study criteria (cont.)

	Inclusion criteria	Exclusion criteria
Intervention	Interventions related to physical activity can be a part of bigger issues i.e., NCDs, obesity, health promotion	No interventions or studies are about epidemiology, barriers or enabling factors, knowledge, attitude, tools, study design or protocol, guidelines, specific training, or specific sport.
Comparison	Physically active population and physically inactive or normal population, or pre-and post-comparison.	Opposite to inclusion criteria.
Outcome	Physical activity duration/frequency, sufficient physical activity level, energy expenditure, steps, fitness, and participation.	Outcomes are not related to physical activity.
Setting	Urban setting.	Rural setting.
Study	Finished primary and quantitative study.	Rural setting. Review, qualitative study, opinion.
Others	Full-text available, English language, human study.	Opposite to inclusion criteria.

A two-step procedure was adopted for the selection of eligible articles from among the retrieved results. Firstly, two authors (TT and CT) screened the titles and abstracts of the retrieved articles after duplicate removal. Secondly, all potentially relevant studies were re-assessed in full, applying the previously established inclusion/exclusion criteria. The full-text assessment was performed by at least two authors per the study, and disagreements were resolved via discussion.

Data Extraction

A predefined data collection form was used for data extraction. This comprised authorship, year of publication, study origin (country), title, study design, characteristics of study subjects, sampling methods, interventions, physical activity variables, covariates, as well as key findings and policy implications. The statistical significance was defined as $p<0.05$.

The framework for physical activity interventions is based on the World Health Organization (WHO) recommendation on physical activity[1] and Global Physical Activity Questionnaire[17] that characterized physical activity into three domains, namely, work-related, transportation, and recreational

activities. In addition, the Global Action Plan on Physical Activity 2018-2030 classified priority areas for promoting physical activity by creating an active society, active people, active environments, and active systems was also be used.[9]

Quality Assessment and Evidence Synthesis

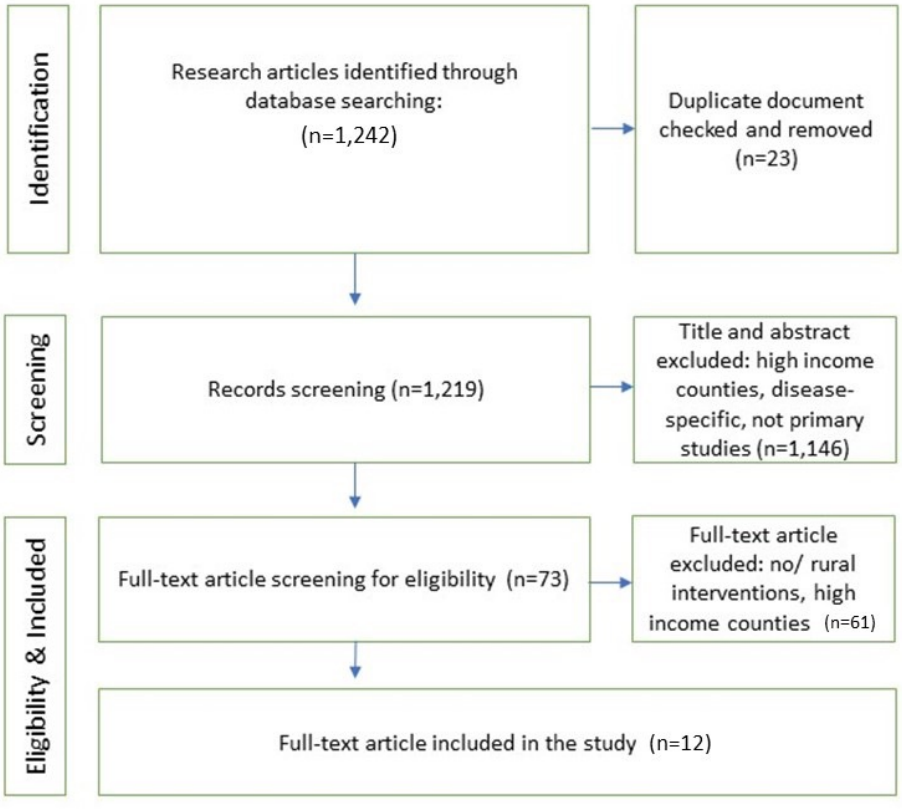
A seven-item checklist was constructed for assessing the quality of the included studies. Six items were adapted from the Center for Evidence-Based Management quality appraisal guidelines.[18] These included: (1) study design [weight: cross-sectional or case study=1, longitudinal or quasi design=2], (2) reliable response rate (80%) [yes=1, no=0], (3) stratification of recruitment areas by suitable environmental characteristics to maintain generalizability [yes=1, no=0], (4) controlling for socio-demographic confounders [yes=1, no=0], (5) calculation of confidence interval for main results [yes=1, no=0], (6) assessment of statistical significance (p-value) [yes=1, no=0]. To improve the appropriateness of appraising the studies included in the current review, an additional item was considered, and (7) method of physical activity measurement (weight: subjective=0.5, objective=1). Higher scores indicate better quality: ≤3 (low quality), 3.1–4.9 (intermediate quality), 5–5.9 (high quality), and ≥6 (very high quality).

Results

Study Characteristics and Quality Assessment

The literature search yielded a total of 1,242 articles. Of these, 12 articles met the eligibility criteria and were included in the final analysis. As demonstrated in Figure 1

Figure 1 PRISMA flow chart of the research result



Most studies were conducted in Asia (6), followed by South America (5), and Africa (1). For the study design, 6 studies adopted a cross-sectional design. For population age groups, most of the studies recruited adults, followed by children and older adults. Most studies were of very high quality. For physical activity outcomes, most of the studies reported total physical activity, followed by total walking/ cycling, and recreational physical activity. Four groups of physical activity intervention were observed and grouped into four themes: (i) recreational space (5), (ii) health promotion programs (3), (iii) neighbourhood environments (3), and (iv) transportation interventions (1), As demonstrated in Table 2.

Table 2 Numerical distribution and characteristics of the included studies

Study category	Number of studies
Country	
Asia	
China	2
Thailand	1
Bangladesh	1
India	1
Turkey	1
South America	
Brazil	2
Mexico	2
Chile	1
Africa	
South Africa	2
Study Design	
Case-study	1
Cross-sectional	6
Longitudinal	2
Experimental	3
Study quality	
Low-quality (score ≤3)	0
Medium-quality (score 3.1-4.9)	1
High-quality (score 5-5.9)	3
Very high-quality (score ≥6)	8
Physical activity outcomes	
Total physical activity	7
Recreational physical activity	1
Total walking/ cycling	4

Table 2 Numerical distribution and characteristics of the included studies (cont.)

Study category	Number of studies
Population age groups	
Children and adolescents	4
Adults	7
Older adults	1

Recreational Space Interventions

Three studies showed that the provision of recreational spaces was significantly associated with physical activity outcomes. For green space interventions, a cross-sectional study by Akpinar et al.[19] revealed a significant positive association between recreational physical activity frequency in urban green space and many trees existence (coefficient =0.326, 95% confidence interval (CI): 0.105–546) and near distance to urban green space (coefficient =0.097, 95%CI: 0.004–0.197). Moreover, exercise equipment (coefficient =0.147, 95%CI: -0.003–0.297), and picnic places (coefficient =0.223, 95%CI: 0.083–0.363) were positively associated with physical activity duration in urban green space in adults in Aydin, Turkey. Likewise, a longitudinal study by Benjamin-Neelon et al.[20] found that a greater time spent in greenspace was associated with increased moderate to vigorous physical activity (0.06; 95%CI 0.03, 0.10) in preschool-aged children in Ensenada and Tijuana, Mexico. In addition, a cross-sectional study by Zhai et al.[21] showed that seniors who spent time in parks with larger surface areas, longer trails, larger natural areas and outdoor fitness equipment had taken more steps while seniors in parks without water expended more energy.

For community health promotion center intervention, a cross-sectional study by Andrade et al.[22] revealed a higher probability of being active in leisure time for individuals who lived less than 500 meters from the program center (Odds Ratio (OR) =1.18, 95%CI: 1.03–1.35). As demonstrated in Table 3

Health Promotion Program Interventions

Two studies showed that health-promotion-based interventions are significantly associated with physical activity outcomes. An experimental study by Heeren, et al.[23] found that health-promotion-intervention students in sub-Saharan African University were more likely to meet at least 150 minutes of moderate to vigorous physical activity recommendation than were control participants, post-intervention (OR = 3.35; 95% CI: 1.33-8.41). Moreover, the intervention group spent more days for vigorous (relative risk (RR) = 2.01; 95%CI: 1.43-2.83) and moderate (RR = 1.40; 95%CI: 1.01-1.95) aerobic activity, but not strength-building activity (RR = 1.37; 95%CI: 0.091-2.07). Likewise, a cross-sectional study by Simoes et al.[24] revealed that women who attended a health promotion program classified as physical activity classes in community settings in 80 cities of Pernambuco state, Brazil, for three or more years, had higher recreational physical activity (adjusted OR = 1.46; 95%CI: 1.11–1.92).

For the steps challenge, a cohort study by Ganesan, et al[25] found that the daily steps

Table 3 Relationships between interventions and physical activity outcomes

Interventions	Intervention - physical activity outcome relationships	Significance
Recreational space		
Green space	**- Akpinar, 2016**: an urban green space intervention in Aydin city, Turkey. **- Results:** a significant positive association was detected between physical activity frequency in urban green space and many trees' existence (b=0.326, 95%CI: 0.105–546) and near distance to urban green space (b=0.097, 95%CI: 0.004–0.197).	- Positively statistical significance
	- Benjamin-Neelon, 2019: a greenspace, physical activity intervention in children from Ensenada and Tijuana, Mexico. **- Results:** a greater time in greenspace was associated with increased physical activity (0.06; 95%CI: 0.03, 0.10; p<0.001) for both cities combined.	- Positively statistical significance
	- Zhai, 2020: neighborhood parks and park design characteristics intervention for elderly. **- Results:** seniors in parks with larger surface areas, longer trails, larger natural areas and outdoor fitness equipment had taken more steps while seniors in parks without water expended more energy.	- Positively statistical significance
Healthy space	**- Katewongsa, 2020**: a healthy space intervention in communities, Thailand. **- Results:** 48% of the residents around sports complexes have used the facilities, while only 22% and 31% participated in the creative city and elderly-healthy community, respectively. Sufficient physical activity was higher in the healthy space program group (81.3%) compared to those who lived near sports complex (67.2%) (t=6.387)	- Statistical significance not reported
Community health promotion center	**- Andrade, 2018**: a community health promotion center intervention in Belo Horizonte, Brazil. **- Results:** a higher probability of being active in leisure time was observed for individuals in the exposed group and who lived less than 500 meters from the program center (OR = 1.18, 95%CI: 1.03–1.35).	- Positively statistical significance

Table 3 Relationships between interventions and physical activity outcomes (cont.)

Interventions	Intervention - physical activity outcome relationships	Significance
Health promotion program		
Health promotion program	**- Heeren, 2018**: Health promotion intervention modules in Sub-Saharan African University Students. **- Results:** health-promotion-intervention participants were more likely to have sufficient physical activity than control participants, post-intervention (OR = 3.35; 95%CI: 1.33-8.41).	- Positively statistical significance
	- Simoes, 2017: physical activity classes in community settings in 80 cities in Brazil. **- Results:** For women, the adjusted odds ratio of having sufficient physical activity was 1.46 (95%CI: 1.11–1.92, p=0.0063) for those living in a city with intervention for three or more years compared to those living in cities that had not adopted intervention.	- Positively statistical significance
Steps challenge	**- Ganesan, 2016**: the Stepathlon, a 100-day international event where employees participate in a workplace-based pedometer program, in India and others. **- Results:** the step count was found to increase by 3,519 steps/day (95%CI: 3,484 to 3,553 steps/day; p<0.0001).	- Positively statistical significance
Neighborhood environment interventions		
Neighborhood streets for outdoor play	**- Cortinez-O'Ryan, 2017**: a temporary road closure intervention to increase space for children to play. **- Results:** a pedometer-determined physical activity was significantly different between baseline and final assessment in the intervention neighborhood for daily steps Monday to Sunday (p=0.006), and steps during the 3-hour intervention (p=0.004). A significant increase was observed after the intervention in the percentage of children meeting the pedometer derived physical activity recommendations in the intervention neighborhood (p=0.027).	- Positively statistical significance

Table 3 Relationships between interventions and physical activity outcomes (cont.)

Interventions	Intervention - physical activity outcome relationships	Significance
Perceive neighborhood environments	**- Jauregui, 2016**: perceived neighborhood environment in Mexico. **- Results:** the significant positive association was found between perceived crime safety-among males (aOR =1.29, 95%CI: 1.07- 1.57) and parks proximity (aOR = 1.12, 95%CI: 1.01-1.24) and having sufficient physical activity.	- Positively statistical significance
Home environment	**- Watterworth, 2021**: physical activity and the home environment of pre-school-aged children in urban Bangladesh. **- Results:** there were no statistically significant associations between factors in the home-built environment (indoor area, presence of an open stairwell, and presence of gross motor activity facilitating items) and having moderate-to-vigorous physical activity by multivariate analysis.	- No statistical significance
Transportation interventions		
Car permission lottery	**- Anderson, 2019**: car permission lottery in Beijing, China. **- Results:** lottery winners took 2.8 fewer transit rides a week (95% confidence interval 1.9 to 3.8; p<0.001) than losers. Daily time spent walking/cycling was lower in individuals at 5.1 years after winning (regression coefficient −24.2 (95%CI = −40.3 to −8.1)).	- Negatively statistical significance

of employees who attended the Stepathlon 100-day international workplace-based pedometer program was increased by 3,519 steps (95%CI: 3,484-3,553 steps). Moreover, there was an improvement of +0.89 exercise days/week after Stepathlon (95%CI: 0.87-0.92 days; p<0.0001), and Stepathlon completion was associated with an improvement in the odds of exercising ≥30 min/day of 1.65 (95%CI: 1.61-1.68).

Neighborhood Environment Interventions

Two studies showed that conducive neighborhood environments were significantly associated with physical activity outcomes, while a study revealed that home environments have no significant associations with physical activity. For neighborhood environment interventions,

an experimental study by Cortinez-O'Ryan, et al.[26] found a significant increase in the percentage of children's daily steps per day (p=0.006), steps during the 3-hour intervention of playing in closing neighborhood streets in Santiago, Chile (p=0.004), and meeting reaching at least 60 minutes of moderate to vigorous physical activity per day in the intervention group (p=0.027). Likewise, a cross-sectional study by Jáuregui, et al.[27] revealed a significant positive association between perceived crime safety (adjusted OR = 1.29, 95% CI: 1.07-1.57) and parks proximity (adjusted OR = 1.12, 95%CI: 1.01-1.24) and reaching at least 150 minutes of moderate to vigorous physical activity recommendation in adults in Cuernavaca, Mexico.

For home environment, a cross-sectional study by Watterworth, et al.[28] did not find any significant associations between factors in the home-built environment (indoor area, presence of an open stairwell, and presence of gross motor activity facilitating items) and physical activity in preschool-aged children in Dhaka, Bangladesh.

Transport Intervention

A study showed that transport intervention was significantly associated with physical activity outcomes. A cross-sectional study by Anderson et al.[29] showed that car permission lottery winners in Beijing, China, took 2.8 fewer public transit rides a week (95%CI: 1.9-3.8) than losers, and daily time spent walking/cycling was lower in individuals at 5.1 years after winning (regression coefficient −24.2 (95%CI: −40.3 to −8.1)).

Discussion

This systematic review aimed to provide a better understanding of the interventions aiming to increase physical activity behaviors in LMIC populations. There were considerable variations in physical activity interventions in LMICs. Almost all interventions (recreational space, health promotion program, neighborhood environment, and transportation) were significantly related to higher physical activity across LMICs and all age groups.

The recreational space interventions accounted for most of the included studies. Optimal distance to access to the places (<1 kilometer), features of parks including trees, exercise equipment, picnic places, size of the park (diameter >200 meters), and trail were essential components of interventions to increase frequency, duration, and steps of physical activity in young children, adults, and older adults.[19-22] This is in line with a systematic review by Elshahat S, (et al.[13] that revealed a positive association between the presence of recreational facilities and an increase in recreational physical activity.

For the health promotion program interventions, the programs particularly health promotion classes in universities or community.[23,24] appeared to encourage participants to meet the WHO physical activity recommendation.[1] On the one hand, the steps challenge program was proven to make employees in workplaces increase their steps and exercise behaviors.[25]

For neighborhood interventions safety was identified as an essential factor to increase opportunities for residents to be active.[27] To increase perceived crime safety in the community, lighting can be installed and proved to be one of the main factors to encourage local people to exercise in the early morning and late evening in LMICs.[30] Temporary adapting environments such as closing streets to be a playground can also increase physical activity

in children.[26] This is in line with the intervention to create health-promoting areas under the expressways in many spots in Bangkok, Thailand.[31]

For transportation intervention, an intervention to increase the accessibility of having personal cars decreased daily time spent walking, cycling, and the number of transit rides.[29] Although good examples of supporting active transport were prominent in high-income countries,[32] cities in Latin America (Bogota (Colombia), Curitiba (Brazil), and Santiago (Chile) can be models for LMICs in implementing multimodal modes of transport. For example, the bus rapid transit, Ciclovia, bike paths/lanes, and car use restriction.[33] In addition, bicycle-sharing systems, and the expansion of subway systems in China,[34] as well as public bus and train systems in Bangkok (Thailand) were well adopted and proved to increase physical activity.[35]

With rigorous search strategies across standard electronic databases, this study systematically addresses the importance of interventions to increase physical activity in LMICs. However, some limitations need to be considered. Given the many physical activity variables examined, the different statistical methods adopted by studies, and the inconsistency in the measurement of physical activity across the included studies, it was not feasible to do a meta-analysis. Most of the evidence in the current study was based on cross-sectional designs, which cannot infer causation. Since this review only included English publications, it is likely that other relevant non-English articles from LMICs were excluded. Future studies should explore literature through more databases and specify objectives to target specific age groups. In addition, according to the COVID-19 pandemic and its consequence in terms of lock-down policy that can hamper physical activity, future studies should address interventions to increase physical activity during and post-pandemic.

Conclusions

Evidence on interventions to increase physical activity in LMICs has been increasing. Recreational space, neighborhood environment, health promotion program, and transportation interventions were significantly related to higher physical activity across LMICs. Policymakers may apply and implement these interventions in their contexts where appropriate.

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มาตรการเพื่อส่งเสริมกิจกรรมทางกายในบริบทเมืองในประเทศรายได้ต่ำและปานกลาง: การทบทวนวรรณกรรมอย่างเป็นระบบ

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สำนักงานพัฒนานโยบายสุขภาพระหว่างประเทศ กระทรวงสาธารณสุข จังหวัดนนทบุรี

บทคัดย่อ

การขาดกิจกรรมทางกายเป็นปัญหาสำคัญด้านสาธารณสุขในระดับโลกและเป็นปัจจัยเสี่ยงอันดับที่ 4 ของการเจ็บป่วยด้วยโรคไม่ติดต่อเรื้อรัง การขาดกิจกรรมทางกายพบได้มากในประชากรที่อาศัยอยู่ในพื้นที่เขตเมืองที่มีการขยายตัวอย่างรวดเร็ว แม้การศึกษาเกี่ยวกับมาตรการเพื่อส่งเสริมกิจกรรมทางกายในบริบทเมืองมีจำนวนเพิ่มขึ้นมาก อย่างไรก็ตามยังพบช่องว่างขององค์ความรู้ดังกล่าวในประเทศที่รายได้ต่ำและปานกลาง การศึกษานี้มีวัตถุประสงค์เพื่อทบทวนและค้นหามาตรการเพื่อการส่งเสริมกิจกรรมทางกายในบริบทเมืองในประเทศรายได้ต่ำและปานกลาง โดยใช้หลักเกณฑ์มาตรฐาน PRISMA จำนวน 3 ฐาน ได้แก่ PubMed, Scopus และ Google Scholar จำกัดเฉพาะการศึกษาที่ใช้ภาษาอังกฤษ และตีพิมพ์ระหว่าง พ.ศ. 2559–2564 การค้นหาพบ 1,276 วรรณกรรม โดยมี 12 การศึกษาที่เข้าได้กับหลักเกณฑ์การคัดเลือก การศึกษาส่วนใหญ่ศึกษาในภูมิภาคเอเชีย (6 การศึกษา) รองลงมาคือภูมิภาคอเมริกาใต้ (5 การศึกษา) การศึกษาส่วนใหญ่เป็นรูปแบบภาคตัดขวาง มาตรการด้านสถานที่สำหรับนันทนาการและออกกำลังกาย (โดยเฉพาะการจัดหาและออกแบบพื้นที่สีเขียว) เป็นมาตรการที่พบมากที่สุด (5) รองลงมาคือ มาตรการส่งเสริมสุขภาพ (3) มาตรการส่งเสริมสภาพแวดล้อมในย่านที่อยู่อาศัย (3) และมาตรการส่งเสริมกิจกรรมทางกายในการเดินทาง (1) โดยพบว่า 9 จาก 12 มาตรการที่มีความสัมพันธ์กับการเพิ่มกิจกรรมทางกายในประชากรในประเทศรายได้ต่ำและปานกลาง ทั้งนี้ ผู้กำหนดนโยบายน่าจะสามารถนำมาตรการเหล่านี้ไปประยุกต์ใช้ในการส่งเสริมกิจกรรมทางกายที่สอดคล้องกับบริบทพื้นที่ต่อไป

คำสำคัญ: กิจกรรมทางกาย; มาตรการ; ประเทศรายได้ต่ำและปานกลาง; บริบทเมือง; การทบทวนวรรณกรรมอย่างเป็นระบบ