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Barriers and facilitators for physical activity domains in Brazil: a systematic review

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Abstract *This study aimed to systematically review scientific evidence on the barriers and facilitators of physical activity (PA) among the Brazilian population, considering different domains (leisure, travel, work/study, and household). The search was conducted in the MEDLINE/PubMed, ISI Web of Science, SCOPUS, BIREME/LILACS, and APA PsycNET databases and was limited to papers published between 2010 and 2020. A manual search of the Brazilian Journal of Physical Activity & Health was also conducted. The selection process consisted of screening titles and abstracts, followed by the analysis of full texts. Each paper was assessed by two independent reviewers, and when discrepancies arose, a third reviewer was consulted. Leisure, environmental barriers and facilitators were the most investigated domains in the 78 included studies. There was consistency in the positive associations between six different intrapersonal and social facilitators for leisure PA and one environmental factor for travel. There have been a small number of investigations on the work/study and household domains, and future investigations on intrapersonal and social barriers and facilitators in the travel domain are important.*

Key words *Motor activity, Populations, Systematic review*

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Introduction

Insufficient physical activity (PA) is associated with several non-communicable chronic diseases and premature mortality, is responsible for substantial economic burden[1], and has negative effects on mental health and quality of life[2]. In Brazil, 5,073 premature deaths are caused by these conditions and can be avoided by PA[3].

It is estimated that 47% of Brazilians are insufficiently active[2]; 84.2% of their weeks are not spent on household; followed by 69.9% on leisure, 68.3% on travel, and 57.4% on a work/study[4]. Thus, understanding individual and collective intervening factors, contexts, and opportunities in different domains is necessary.

The identification and investigation of barriers and facilitators in PA domains are important for practitioners and non-practitioners to understand the PA behavior and guide the performance, analysis, and qualification of actions to promote it[5]. Conceptually, a barrier can be any circumstance or factor that hinders, limits, or prevents people from engaging in a certain behavior, whereas the facilitator is its opposite[6].

PA practice is important in different domains, among which, based on the message that every movement counts[7], leisure and travel are the most studied ones[8-11]. Consequently, there is insufficient evidence on how barriers and facilitators of learning opportunities lead to the appreciation of diverse tasks for a lifestyle of housework and active work in the practices of everything.

Therefore, this study has taken on a scientific task to review barriers in the Brazilian population, considering different domains (leisure, travel, work/study, and household). The study summarizes scientific evidence on its thematic topic that helps understand the factors that increase and are important opportunities for PA. In addition to the originality of this systematic review for the production of knowledge, the present study contributes to the development of strategies to promote PA in the country, considering its cultural, demographic, and social diversity. Finally, the study aimed to systematically review scientific evidence on the barriers and facilitators of PA among the Brazilian population, considering different domains (leisure, travel, work/study, and household).

Methods

This systematic literature review followed the guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-analysis[12]. The study protocol was registered and approved by the International Prospective Register of Systematic Reviews under code CRD42021209718.

Search and selection of studies

A systematic search for studies was performed using six electronic bibliographic databases: MEDLINE/PubMed, ISI Web of Science, SCOPUS, BIREME/LILACS, and APA PsycNET. The references of the included studies were then manually consulted to find potential studies, and those that met the criteria established for the present review were added. Further, a manual search for studies was performed in the journal Brazilian Journal of Physical Activity & Health (BJPAH) between January 2010 and June 2020, as it is a specific journal that has published articles on this topic. References in the selected articles in the RBAFS were analyzed.

For the electronic search, the key terms of the pre-established PECO strategy were used (population, exposure, comparison, outcome) (Chart 1)[13]. The search protocol is described in Supplementary Material (available from: https://doi.org/10.48331/scielodata.YLH8SR). Studies were selected in three stages (Figure 1): 1) reading the titles and abstracts. When they did not have enough information to decide, they were kept for the next stage; 2) full reading of the selected studies; 3) conducting a search in the reference lists of the studies selected in the previous step to identify potentially-relevant studies that were not identified in the initial selection process. At all stages, two reviewers independently evaluated the data. In case of divergence, a third reviewer was consulted.

EndNote X8 software was used to manage, store, and organize references and remove duplicate studies. To evaluate the reading of titles, abstracts, and full text of the articles, the Rayyan QCRI platform was adopted. Microsoft Excel ® spreadsheets were used for the data extraction.

Inclusion and exclusion criteria

The following were adopted as the criteria for the inclusion of the studies: a) being original with a quantitative, qualitative, or mixed methods; b) discrimination of at least one of the PA

Chart 1. Electronic databases/journals, descriptors/terms (PECO strategy) and Boolean operators used in the search for original studies on barriers and facilitators of domain-specific physical activity.

Database/ journal	PECO Strategy Descriptors/terms[a]	Boolean operators	Filters
BIREME/Lilacs **Medline/PubMed** **SciELO** **Scopus** **APA PsycNET** **Web of Science** **BJPAH journal**	**POPULATION (P):** (Brazil* [Title/Abstract]) AND (Humans [MeSH Terms])	*AND and OR*	Language (English, Portuguese or Spanish), Period (2010 to 2020)
	EXPOSure (E): ("motor activity" [MeSH Terms]) OR (exercise [MeSH Terms]) OR ("Physical Education" [Title/Abstract]) OR ("physical activity" [Title/ Abstract]) OR ("recreational activity" [Title/ Abstract]) OR (sport* [Title/Abstract]) OR (sedentary [Title/ Abstract]) OR ("physical inactivity" [Title/ Abstract]) OR ("active transport" [Title/Abstract]) OR ("active transportation" [Title/Abstract]) OR ("active commut*" [Title/Abstract]) OR ("active travel*" [Title/Abstract]) OR (bicycle [Title/Abstract]) OR (bicycling [MeSH Terms]) OR (bike [Title/Abstract]) OR (biking [Title/Abstract]) OR (walk [Title/Abstract] OR (walking [MeSH Terms]) OR ("leisure activities" [MeSH Terms]) OR (dancing [MeSH Terms]) OR (gardening [MeSH Terms]) OR ("activities of daily living" [MeSH Terms])		
	COMPARISON (C): Not applicable		
	***OUTCOMES* (O)**: (covariates [Title/Abstract]) OR (correlates [Title/Abstract]) OR (determinants [Title/ Abstract]) OR (mediators [Title/Abstract]) OR (moderators [Title/Abstract]) OR (predictors [Title/ Abstract]) OR (environment [MeSH Terms]) OR (contributors [Title/Abstract]) OR (facilitators [Title/ Abstract]) OR (barriers [Title/Abstract])		

Descriptors in English/Portuguese; [a] combinations of descriptors and terms used; exemplified string; MeSH: Medical Subject Headings; BJPAH: Brazilian Journal of Physical Activity & Health.

Source: Authors.

domains; c) being a study on Brazilian samples/ participants; d) being published in Spanish, English, or Portuguese; and e) being available in full. Review studies, short articles, conference abstracts, theses, dissertations, points of view, essays, and editorials were excluded.

Definition of terms

For this study, potential facilitators and modifiable barriers to PA in different life cycles were considered exposure, such as lack of time, aspects of the perceived and built environment, and social support from friends and family; demographic aspects (e.g., sex and age); socioeconomic factors (e.g., income and educational level); and health indicators (e.g., cardiovascular risk behaviors and disease diagnosis).

Data extraction

For each original study, the data were extracted using a predefined form. Data extraction was performed based on the following indicators: a) study characteristics, b) methodological characteristics, c) data analysis, d) identification of the PA domain, and e) results on the relationship between PA domains and barriers and facilitators. Data were extracted by an independent reviewer and were subsequently checked by a second independent reviewer. In case of their disagreements, a meeting was held for peer discussion and consensus.

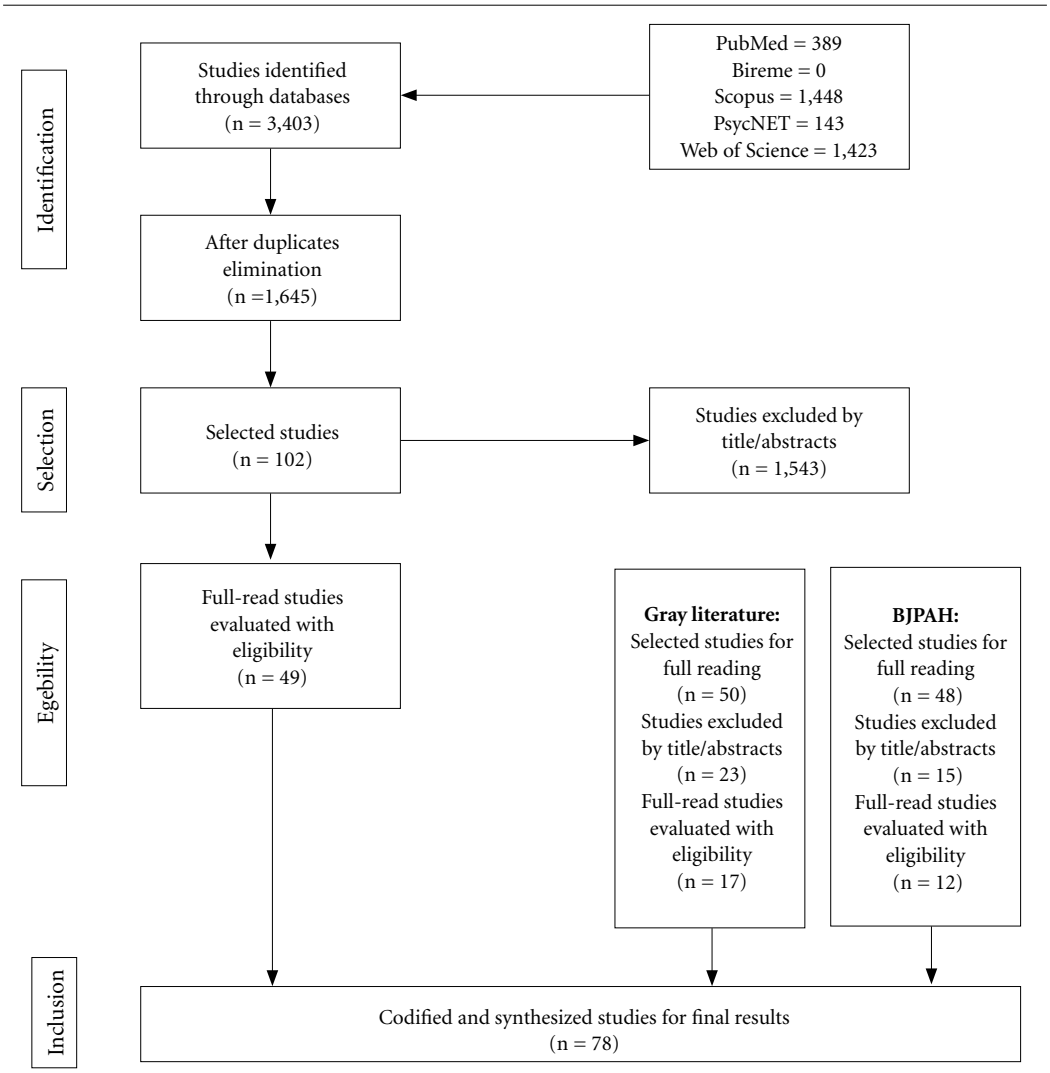

Figure 1. Flowchart of study screening and selection process.

BJPAH – Brazilian Journal of Physical Activity and Health.

Source: Authors.

Assessment of the methodological quality of the studies

The methodological quality of the articles was critically assessed by considering the main procedures described in the studies. To this end, an instrument was developed based on the recommendations of the Critical Appraisals Skills Programme[14] with central questions adapted to include cohort, case-control, and qualitative studies.

The instrument consisted of five items that determined the study approach in terms of its quantitative or qualitative nature: a) study design; b) adequacy of the sample regarding the target population or selection of participants to respond to the objectives of the study; c) existence of a comparative group or presence of evidence/consistent results for the conclusion presented; d) tested and validated tool/instrument or selection of suitable instruments to respond to the research objective; e) adoption of measures to re-

duce bias in the results. For each evaluated item, three response options were assigned, being in item A: descriptive observational = 1, cross-sectional = 2, cohort, case-control, or intervention (experimental) = 4; and for the other items: no information = 1; not presenting the information = 2; and having presented the information = 4.

Subsequently, a score was calculated based on the sum of the scores assigned to each item (4-20 points). The studies that achieved the highest score were those that had better quality (level A: studies that presented > 70.0% of the total points [> 14 points]; level B: studies that presented between 50.0 and 69.9% of the points [10 to 13 points]; level C: studies between 25.0 and 49.9% of points [5 to 9 points]; and level D: studies < 25.0% of points [< 5 points]). These criteria were adapted from the Consolidated Standards of Reporting Trials, similar to that adopted in another review article[15]. Thus, no study was excluded from the review after methodological quality assessment.

Description and synthesis of data

Results were described after the data were extracted, respecting the stratifications performed in each study according to sex or age group. Each stratum was considered an independent sample, as has already been reported in other systematic reviews in the area[15-17]. Thus, the prevalence of barriers and facilitators was described by categories (intrapersonal, environmental, or social) by PA practice domains and life cycles.

To perform evidence synthesis, we initially decided to divide the studies into descriptive and inferential analyses. Articles with descriptive analyses were reported in absolute and relative frequencies of barriers and facilitators in the PA domain. For inferential analyses, the procedures and criteria for coding and summarizing associations were used, similar to those used in other systematic reviews[15-17]. For this, the graphic signaling of "+" was assigned to the independent sample that indicated a significant ($p < 0.05$) and positive association; the number "0" was assigned when there was no indication of the association direction ($p > 0.05$); and finally, the symbol "-" was used when there was a significant ($p < 0.05$) and inverse association between PA practice and the specific barrier or facilitator per domain.

The consistency level of associations was assigned according to an odds ratio (OR) calculation, in which the most prevalent number of associations of independent samples (+, -, 0) was the numerator, and the sum of other independent samples with lower frequency was the denominator. Thus, OR > 2.00 would be classified as high consistency for positive association (++), negative association (--), or absence of association (00). OR between 1.11 and 2.00 in case of less than five independent samples analyzed were classified as having low consistency of association, coded with the signs of +?, -? or 0?. Finally, OR ≤ 1.10 indicated inconsistent association (undefined in the sense of evidence) or no association for the PA practice domain as a function of the barrier or facilitator, being coded with the sign of "??". In cases of less than two independent samples of association, no summary of evidence for insufficient number of studies (I) was assigned.

Results

Study selection

A total of 3,403 studies were identified (Figure 1). After removing duplicates (n = 1,758), 1,645 studies were sent for evaluation of titles and abstracts). At the end of this stage, 1,543 studies were excluded for the following reasons: discrepancies regarding the subject (n = 1,398) and publication type (n = 30). After reading full studies, 49 of them were deemed eligible. We also included 17 studies retrieved by a manual search in the list of bibliographic references and 12 articles identified in the RBAFS. The final descriptive synthesis consisted of 78 studies.

Description of included articles

The synthesis involved 71 cross-sectional studies, five longitudinal studies, one descriptive study, and one cluster randomized controlled trial. Altogether, the synthesis included all life cycles, with 55 studies on adults, 33 on older adults, 23 on adolescents (6-17 years old), and two on children (0-5 years old). In 63 studies, barriers and facilitators for leisure were presented: 27 studies for travel, five studies for work/study, and one study for household. The selected studies were conducted mostly in the South (65.0%), Southeast (30.0%), and Northeast (17.0%) regions. The cities of Curitiba (n = 23), Fortaleza (n = 8), Pelotas (n = 8), Rio de Janeiro (n = 4), João Pessoa (n = 4), Londrina (n = 4), and Florianópolis (n = 3) showed higher numbers of investigations, as described in Supplementary Material (avail-

able from: https://doi.org/10.48331/scielodata.YLH8SR).

Regarding the methodological quality of the studies (Table 1), 77.0% were classified as level A, 21.8% as level B and 1.1% as level C. The item referring to the research design presented the lowest average value (average value of 2.0). The items that obtained the highest averages in the evaluation of the quality of the studies were: the tested and validated tool/instrument; selection of adequate instruments to answer research questions; sample adequacy regarding the target population or selection of participants to respond to the objectives of the study; the existence of a comparative group or presence of evidence/consistent results for the conclusion presented and adoption of measures to reduce bias in the results (4.0, 3.0, 3.0 and 3.0 points on average, respectively).

Figure 2 shows that when analyzing the barriers and facilitators in the PA domain considering different life cycles, studies on children and adolescents had a greater number of factors related to environmental barriers and facilitators of leisure practices (100% and 47.8%, respectively) and travel (100% and 85.4%, respectively). Studies on adults investigated more barriers and intrapersonal and environmental facilitators of leisure PA (49.7% and 46.5%, respectively) and travel (51.2% and 48.2%, respectively). The studies reported a higher frequency of intrapersonal aspects of work/study (84.9%), and exclusive social factors in housework (100%). For the older adults, the most investigated environmental barriers and facilitators were work/study, travel, and leisure (100%, 66.3%, and 53.8%, respectively), and social barriers were household (100%) (Figure 2).

Summary of included articles

Studies with descriptive analysis showed 179 barriers and facilitators for leisure PA, 192 for travel, and 18 for work/study. Among them, the highest frequency was observed for environmental factors in leisure and travel and for social factors in work/study (Table 1).

Table 2 presents information on the synthesis of evidence from studies with inferential analyses according to the proposed categories of barriers and facilitators. In general, high consistency was identified for a positive association (++) between PA practice and seven different barriers and facilitators, six of which were for leisure PA and a barrier and facilitator for travel.

PA in leisure showed a high consistency of positive association for the intrapersonal factors such as "availability of personal equipment," "higher motivation and having goals," and "more positive beliefs about capabilities" and for the social factors "better/more positive general social support," "better/more positive support from family", "better/more social support from others," and "high level of physical activity among friends and family". The categories "positive past experiences", "better/more social support from friends," and "better walkability" were presented as facilitators but with low consistency.

For travel, only the item "better land use mix" in the category of environmental factors showed a high consistency of positive association with PA. The categories that showed low consistency were "availability of personal equipment" and "better walkability." Finally, no evidence of association was identified for barriers and facilitators of PA with high consistency related to work/study and household (Table 2). In the work/study, there was only low consistency of "better/more social support from others" and "better/more positive social norms" as facilitators.

Discussion

This review synthesized scientific evidence on the barriers and facilitators of PA in different domains of Brazilians. Leisure and travel barriers and facilitators were the most investigated factors, and all life cycles were covered. The main findings show evidence of positive associations between six different barriers or intrapersonal and social facilitators for leisure PA and an environmental factor for PA while travel. However, there is no consistent evidence of an association between work/study and household.

Studies without inferential analyses were directed at the intrapersonal scope of leisure and study/work. Conversely, environmental factors were investigated more in terms of displacement. It can be inferred that the characteristics of the analysis permeated the investigated content, and the proportion of intrapersonal factors was higher than that of the other factors in the non-inferential analysis, a fact that is different from the inferential analysis. The studies without inferential analysis considered by the present review fall within qualitative and quantitative approaches, and with regard to technical procedures, they can be pinpointed as descriptive and empirical studies[93]. This contextualization allows for the understanding that intrapersonal aspects actually need information – or the knowledge of current

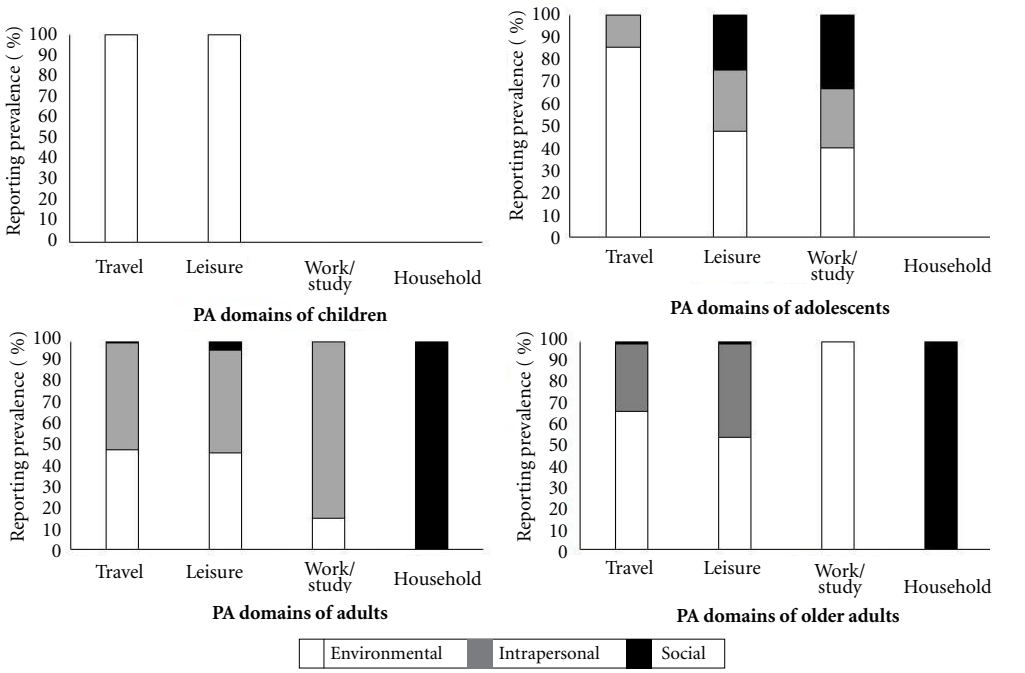

Figure 2. Description of reported barriers and facilitators prevalence by physical activity domains according to life cycles.

Source: Authors.

conditions – even before establishing a causal relationship with PA. Despite presenting the character of subjectivity, the record of self-report in descriptive studies establishes the existence of characteristics of the object of study – in this case, the barriers and facilitators of intrapersonal indicators. In this way, as proposed by Thomas et al[94], problems can be solved and practices can be improved based on the description and analysis of observations.

Four PA domains were adopted, according to the Physical Activity Guide for the Brazilian Population[95]. In the studies analyzed by this review, barriers and facilitators of displacement were reported across all life cycles. Active travel is linked to opportunities for people to incorporate PA into their daily routines, for which the infrastructure (environment) needs to be improved to support these practices[96]; knowledge from studies on these aspects will help in this regard. Although environmental factors have been the most-studied category, the evidence of their association is inconsistent. Only the facilitator "better-mixed land use" showed consistent evidence of a positive association with active displacement. Areas with a diversity of land use, such as the presence of shops, residences, and spaces for recreation, allow for more destinations to walk or cycle as a form of displacement[49,51].

Barriers and facilitators of leisure were identified in all life cycles, with social and intrapersonal factors being reported most frequently. Leisure was the domain that presented the highest number of reported indicators and the highest number of associations, concentrated on intrapersonal and social factors. In a review study, intrapersonal indicators were reported most frequently in adults and older adults in Brazil[97], reinforcing the fact that there are few investigations at the social level. Although little investigated, the indicators of social status, among demographic aspects and education, were the only ones that showed inequality in the practice of PA[98]. As it is considered a domain with great potential for intervention, and because it contemplates the available time based on preferences and opportunities[95], the categories found in the present study as leading Brazilians to be more active during leisure time corroborate the concept presented in the Physical Activity Guide for the Brazilians[95].

Table 1. Description of barriers and facilitators in studies without inferential analysis by physical activity domain.

Barriers and facilitators	Leisure		Travel		Work/study	
	n = 179	%	n = 192	%	n = 18	%
Intrapersonal						
Availability of personal equipment	7	3.91	6	3.13		
Better skills	3	1.68	1	0.52		
Pleasure and fun with physical activity	2	1.12	4	2.08		
Higher motivation and having goals	5	2.79	6	3.13	1	5.56
Lack of time and presence of concurrent behaviors	5	2.79	7	3.65	8	44.44
Lower costs	1	0.56	2	1.04		
More positive beliefs about capabilities	6	3.35	6	3.13	2	11.11
More positive beliefs about consequences	22	12.29	9	4.69	1	5.56
More/better knowledges	1	0.56	3	1.56		
Negative emotions	9	5.03				
Positive past experiences	2	1.12				
Worse health condition	8	4.47	1	0.52		
Social						
Better/More positive general social support	2	1.12	1	0.52		
Better/more positive social norms	7	3.91	2	1.04		
Better/more positive support from family	8	4.47	6	3.13		
Better/more positive support from friends	3	1.68	2	1.04		
Better/more positive support from friends	12	6.70	14	7.29		
Worse perceived safety	10	5.59	14	7.29		
Environmental						
Better land use mix			2	1.04		
Better quality and condition of places	5	2.79	8	4.17		
Better road safety	13	7.26	27	14.06		
Better street connectivity			4	2.08		
Better public transport provision	8	4.47	11	5.73		
Existence of active travel infrastructure	10	5.59	18	9.38		
Existence of facilities within places	5	2.79	8	41.7		
Existence of. shorter distance to. and better access to places	22	12.29	14	7.29	6	33.33
Availability health promotion programs	2	1.12	1	0.52		
Participation in supervised activities	1	0.56				

Note: higher physical activity of friends and family; better general urban design and built environment; better walkability better quality of physical activity programs; better quality of instructors were not described.

Source: Authors.

Finally, the consistency of associations between barriers and facilitators at work/study was limited. In these domains, investigations on children were not found; articles with adolescents investigated environmental, intrapersonal, and social factors; those with adults studied environmental and intrapersonal factors, while those focused on the older adults reported only environmental factors. With low consistency, the facilitators "better/more social support from others" and "better/more positive social norms" influence PA practice. When considering the influence of context on behaviors, this domain includes activities conditioned prior to the performance of work or study[95]. The ecological approach to lifestyles predicts different levels of influence, and social support is an important contextual determinant[99]. Another perspective is the difference between the activities in the process of retirement after work/study, in which the

Table 2. Number of synthesis units showing negative (-), positive (+) and no evidence (o) of association and the consistency observed between barriers and facilitators and higher levels of domain-specific physical activity.

Barriers and facilitators	Work/study							Leisure							Travel							Household						
	Synthesis				Evidence			Synthesis				Evidence			Synthesis				Evidence			Synthesis				Evidence		
	-	0	+	Total	n/N	%	R	-	0	+	Total	n/N	%	R	-	0	+	Total	n/N	%	R	-	o	+	Total	n/N	%	R
Intrapersonal	**2**	**39**	**5**	**46**	**39/46**	**84.8**	**00**	**46**	**129**	**79**	**254**	**129/254**	**50.8**	**0?**	4	54	**16**	**74**	**54/74**	**73.0**	**00**	**0**	**0**	**0**	**0**			I
Availability of personal equipment	0	0	0	0			I	0	2	10	12	10/12	83.3	++	0	0	4	4			I	0	0	0	0			I
Better skills	0	0	0	0			I	1	5	1	7	5/7	71.4	00	0	0	0	0			I	0	0	0	0			I
Pleasure and fun with physical activity	0	0	0	0			I	0	2	2	4			I	0	0	1	1			I	0	0	0	0			I
Higher motivation and having goals	0	0	0	0			I	1	1	5	7	5/7	71.4	++	0	0	0	0			I	0	0	0	0			I
Lack of time and presence of concurrent behaviors	0	3	0	3			I	12	32	19	63	32/63	50.8	0?	1	9	3	13	9/13	69.2	00	0	0	0	0			I
Lower costs	0	0	0	0			I	2	4	1	7	4/7	57.1	0?	0	0	0	0			I	0	0	0	0			I
More positive beliefs about capabilities	0	2	0	2			I	0	4	14	18	14/18	77.8	++	0	0	0	0			I	0	0	0	0			I
More positive beliefs about consequences	0	6	0	6	6/6	100.0	00	1	14	7	22	14/22	63.6	00	0	6	0	6	6/6	100.0	00	0	0	0	0			I
More/better knowledges	0	0	0	0			I	0	4	2	6	4/6	66.7	00	0	0	0	0			I	0	0	0	0			I
Negative emotions	2	24	5	31	24/31	77.4	00	8	33	7	48	33/48	68.8	00	3	29	5	37	29/37	78.4	00	0	0	0	0			I
Positive past experiences	0	2	0	2			I	0	3	4	7	4/7	57.1	+?	0	2	1	3			I	0	0	0	0			I
Worse health condition	0	2	0	2			I	21	25	7	53	25/53	47.2	0?	0	8	2	10	8/10	80.0	00	0	0	0	0			I

it continues

Table 2. Number of synthesis units showing negative (-), positive (+) and no evidence (o) of association and the consistency observed between barriers and facilitators and higher levels of domain-specific physical activity.

Barriers and facilitators	Work/study							Leisure							Travel							Household						
	Synthesis				Evidence			Synthesis				Evidence			Synthesis				Evidence			Synthesis				Evidence		
	-	0	+	Total	n/N	%	R	-	0	+	Total	n/N	%	R	-	0	+	Total	n/N	%	R	-	o	+	Total	n/N	%	R
Social	**3**	**16**	**15**	**34**	**16/34**	**47.1**	**0?**	**18**	**88**	**58**	**164**	**88/164**	**53.7**	**0?**	**9**	**38**	**5**	**52**	**38/52**	**73.1**	**00**	**2**	**15**	**3**	**20**	15/20	75.0	**00**
Better/More positive general social support	0	0	0	0			I	0	9	5	14	9/14	64.3	00	0	3	0	3			I	0	0	0	0			I
Better/more positive social norms	0	5	7	12	7/12	58.3	+?	0	11	6	17	11/17	64.7	00	0	5	2	7	5/7	71.4	00	0	9	3	12	9/12	75.0	00
Better/more positive support from family	0	0	0	0			I	0	7	16	23	16/23	69.6	++	0	0	0	0			I	0	0	0	0			I
Better/more positive support from friends	0	6	4	10	6/10	60.0	00	2	5	11	18	11/18	61.1	++	0	0	1	1			I	0	0	0	0			I
Better/more positive support from friends	0	0	4	4			I	0	4	10	14	10/14	71.4	++	0	1	1	2			I	0	0	0	0			I
Higher physical activity of friends and family	0	0	0	0			I	0	1	8	9	8/9	88.9	++	0	0	0	0			I	0	0	0	0			I
Worse perceived safety	3	5	0	8	5/8	62.5	00	16	51	2	69	51/69	73.9	00	9	29	1	39	29/39	74.4	00	2	6	0	8	6/8	75.0	00

it continues

Table 2. Number of synthesis units showing negative (-), positive (+) and no evidence (o) of association and the consistency observed between barriers and facilitators and higher levels of domain-specific physical activity.

Barriers and facilitators	Work/study							Leisure							Travel							Household						
	Synthesis				Evidence			Synthesis				Evidence			Synthesis				Evidence			Synthesis				Evidence		
	-	0	+	Total	n/N	%	R	-	0	+	Total	n/N	%	R	-	0	+	Total	n/N	%	R	-	o	+	Total	n/N	%	R
Environmental	**0**	**9**	**5**	**14**	**9/14**	**64.3**	**00**	23	282	173	**478**	**282/478**	**59.0**	**0?**	**4**	**97**	**72**	**173**	**97/173**	**56.1**	**0?**	**0**	**0**	**0**	**0**			I
Better general urban design and built environment	0	0	0	0			I	2	18	11	31	18/31	58.1	0?	0	13	12	25	13/25	52.0	0?	0	0	0	0			I
Better land use mix	0	0	0	0			I	2	45	9	56	45/56	80.4	00	0	4	10	14	10/14	71.4	++	0	0	0	0			I
Better quality and condition of places	0	3	0	3			I	3	39	37	79	39/79	49.4	0?	0	16	9	25	16/25	64.0	00	0	0	0	0			I
Better road safety	0	0	0	0			I	3	18	4	25	18/25	72.0	00	1	7	5	13	7/13	53.8	0?	0	0	0	0			I
Better street connectivity	0	0	0	0			I	0	5	0	5	5/5	100.0	00	0	6	5	11	6/5	54.5	0?	0	0	0	0			I
Better public transport provision	0	0	0	0			I	2	7	1	10	7/10	70.0	00	1	14	4	19	14/19	73.7	00	0	0	0	0			I
Better walkability	0	0	0	0			I	0	2	4	6	4/6	66.7	++	0	2	3	5	3/5	60.0	++	0	0	0	0			I
Existence of active travel infrastructure	0	0	0	0			I	1	19	15	35	19/35	54.3	0?	0	16	7	23	16/23	69.6	00	0	0	0	0			I
Existence of facilities within places	0	0	1	1			I	1	0	0	1			I	0	0	0	0			I	0	0	0	0			I
Existence of. shorter distance to. and better access to places	0	3	3	6	3/6	50.0	??	6	115	91	212	115/212	54.2	0?	2	18	17	37	18/37	48.6	0?	0	0	0	0			I
Availability health promotion programs	0	0	0	0			I	3	8	0	11	8/11	72.7	00	0	0	0	0			I	0	0	0	0			I
Better quality of physical activity programs	0	2	0	2			I	0	0	0	0			I	0	0	0	0			I	0	0	0	0			I
Participation in supervised activities	0	1	0	1			I	0	6	1	7	6/7	85.7	00	0	1	0	1			I	0	0	0	0			I
Better quality of instructors	0	0	1	1			I	0	0	0	0			I	0	0	0	0			I	0	0	0	0			I

R: ratting related with the level of evidence ratio calculation; I: Insufficient number for analysis (< 5 studies).

Source: Authors.

marked variations that lead to other adjustments, including social life[100], are studied.

Only one study investigated household, making it difficult to carry out the synthesis. Adults and older adults reported barriers and facilitators related to social factors, although these influences could not be attributed to PA. The tasks performed at home are characteristic of the region in which they live, imbricated in sociocultural precepts[101]. According to a study by Lima et al.[101], the determinants of gender and economic class were attributed to PA among adolescents. Thus, domestic tasks represent the social context into which families are inserted[101]. The scarcity of studies on household can be attributed to difficulties measuring the level of PA in this domain, the difficulty understanding the intensity of these activities, the little interest of researchers in this domain, and the cultural context and greater performance of these activities by women. Furthermore, understanding adjustments in the responsibilities of tasks in the family is vital and even contributes to mental health and good functioning of the collective[102]. PA performed through household tasks is part of the affective care practices of the domestic group, in which they seek to maintain and balance a routine[102].

As strengths of this review, we highlight the search conducted in different databases, the definition of the classifications used to summarize the included findings, independent evaluations by reviewers at different stages, and the evaluation of the methodological quality of the studies. Further, 77.0% of the study samples were probabilistic in all regions of the country, which contributes to the generalization of the results about the Brazilians. Brazil is a continental country, with diversity in terms of culture, climate, and economic aspects, which reinforces the robustness of the content in view of the proposal to carry out a national analysis with the description of life cycles and the synthesis of evidence stratified in the PA domain. Limitations of this study include the high number of cross-sectional studies, and little information on children and the domains of household and work/study. Also, instruments for methodological assessment in the studies used in this review deserve to be mentioned. The search method adopted in this study may not be adequate to identify other studies on the subject considering the inclusion criteria. However, this was minimized by the use of a variety of databases and procedures. However, it is believed that the inclusion of these studies would not significantly affect the results obtained. Arbitrary definitions were adopted for the coding criteria and summarization of the results about the association between PA domains with barriers and facilitators. A comparable methodology was applied in a similar review[15]. Finally, the consistency of the associations identified in the studies was analyzed; but not their magnitude, owing to a variety of statistical procedures.

Evidence shows that PA has already been investigated in different domains and that barriers and facilitators are related to environmental, social, and intrapersonal factors and must be analyzed according to the life cycle. However, stratified conclusions for each of these groups still deserve caution because of the inconsistency of the findings, even if reported with considerable frequency. Overall, the evidence is limited or inconclusive because of low consistency. In leisure, intrapersonal and social aspects facilitate PA.

This study sought to understand the barriers and facilitators of PA in its different domains and may provide guidelines for future actions to promote more effective PA according to life cycles. The reduced number of investigations on household and work/study highlights the importance of expanding investigations on this topic. Further investigations into the barriers and facilitators related to social and intrapersonal factors for displacement are suggested.

Collaborations

All authors conceptualized the review, discussed the search strategy and extraction tools, worked on extracting the results, and contributed to the final manuscript. M Christofoletti, LMT Garcia, G Mendonça, MA Binotto, FL Silva-Júnior developed the search strategy, extraction tools, and the choice of methodological quality assessment of the studies. TRB Benedetti oversaw the project and LMT Garcia provided critical guidance throughout the process. G Mendonça and FL Silva-Júnior evaluated the methodological quality of the studies. M Christofoletti organized the synthesis of the results.

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