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ORIGINAL ARTICLE

Beneficial and harmful effects of physical activity on care-seeking for low back pain: the AUTBACK study

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Abstract

Purpose People who seek more care for low back pain (LBP) tend to experience poorer recovery (e.g. higher pain and disability levels). Understanding the factors associated with care-seeking for LBP might improve patient outcomes and potentially alleviate the burden of LBP on global health systems. This study aimed to investigate the relationship between different intensities, volumes, and domains of physical activity and care-seeking behaviours, in people with a history of LBP.

Methods Longitudinal data from adult twins were drawn from the AUstralian Twin BACK study. The primary outcome was the total self-reported frequency (counts) of overall utilisation of care for LBP, over 1 year. Secondary outcomes were the utilisation of health services, and the utilisation of self-management strategies, for LBP (assessed as total frequency over 1 year). Explanatory variables were device-based measures of sedentary behaviour and moderate-to-vigorous intensity physical activity, and self-reported physical workload, and work, transport, household, and leisure domain physical activity, at baseline.

Results Data from 340 individuals were included. Median age was 56.4 years (IQR 44.9–62.3 years) and 73% of participants were female. Medium-to-high baseline volumes of sedentary behaviour were significantly associated with greater counts of overall care utilisation (IRR 1.60, 95%CI 1.04–2.44) and utilisation of self-management strategies (IRR 1.60, 95%CI 1.02–2.50) for LBP, over 1 year. Medium-to-high baseline volumes of household domain physical activity were significantly associated with greater counts of utilising self-management strategies for LBP over 1 year (IRR 1.62, 95%CI 1.04–2.53). No explanatory variables were associated with the utilisation of health services for LBP.

Conclusion People who engage in higher baseline volumes of sedentary behaviour or physical activity in the household setting (e.g. housework, gardening, yard work, general household maintenance) utilise 1.6 times more care for LBP over 1 year. Findings suggest that higher volumes of these behaviours may be harmful for LBP. No intensities, volumes, or domains of physical activity demonstrated clear benefits for LBP. Where feasible, patients and clinicians should collaborate to screen and develop strategies to reduce engagement in sedentary behaviour or physical activity in the household setting. Contextual factors (e.g. patient symptom severity, sociocultural roles, occupational demands) should be considered when devising appropriate behaviour change strategies.

Keywords Low back pain · Health care utilisation · Physical activity · Sedentary behaviour

Introduction

Low back pain (LBP) is the highest contributor to disability in the world [1], imposing a substantial economic burden on health systems. LBP is a leading reason for emergency department presentations and admissions globally [2], even though few cases constitute medical emergencies. Up to 30% of patients with LBP in family practice are prescribed opioids [3], despite their limited role in managing LBP, and one in four receive imaging referrals [4]. Similarly, even without clear evidence for their effectiveness, invasive procedures are frequently performed to manage LBP [5]. Given that people who seek more care for LBP tend to experience poorer and more complicated recovery (e.g. higher pain and disability levels) [6], understanding and addressing the factors associated with care-seeking for LBP might improve patient outcomes and potentially alleviate the burden of LBP on global health systems.

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Elucidating the relationship between physical activity or sedentary behaviour and care-seeking behaviours for LBP may be clinically useful, due to the modifiable nature of these lifestyle factors. However, to our knowledge, only three studies [7–9] have been conducted on this topic and findings have been conflicting. In part, this may be due to divergent methods used to define and assess physical activity—which can be performed at different intensities and across different domains—and/or care-seeking behaviours across these studies. For example, two cross-sectional studies, which relied on self-reported, single-domain measures of physical activity, did not identify any significant associations between physical activity and care-seeking for LBP [7, 8]. In contrast, a recent longitudinal study found that increased time spent in moderate-to-vigorous intensity physical activity, assessed with an accelerometer, was associated with lesser analgesic use over 1 year (Incidence Rate Ratio [IRR] 0.97, 95% confidence interval [CI] 0.96–0.99) [9], whilst increased engagement in higher physical workload tasks was associated with greater analgesic use for LBP over 1 year (IRR 1.02, 95%CI 1.01–1.05) [9]. Other types of care-seeking behaviours for LBP, such as utilisation of health services, were not explored.

Further studies with comprehensive methods for defining and assessing physical activity, sedentary behaviour, and care-seeking behaviours for LBP may support the development of clearer guideline recommendations regarding these lifestyle factors for people with LBP. Therefore, the aim of this study was to investigate the relationship between different amounts (i.e. intensities and volumes), and/or domains of physical activity or sedentary behaviour, and future care-seeking behaviours for LBP in people with a history of LBP.

Patients and methods

Design and study population

Data for this study were drawn from the AUstralian Twin BACK (AUTBACK) study, a longitudinal, observational cohort study which aimed to investigate the relationship between physical activity and LBP outcomes [10]. Briefly, between 2015 and 2020, 401 participants from urban, remote, or rural regions of Australia were recruited from Twins Research Australia [11]. Eligible participants were twins aged over 18, with internet access via computer or smartphone, and an active email account. Those with self-reported serious spinal pathology (e.g. inflammatory, metastatic, or infectious disease of the spine), recent history of spinal surgery ($\leq$ 12 months), or pregnant women were excluded. Lifetime prevalence of LBP was assessed via the question: "in your lifetime, have you ever had pain in your low back?" (yes/no). A total of 340 participants (from complete and incomplete twin pairs) with available baseline and weekly data, and who reported a lifetime prevalence of LBP, were included in the current study.

Assessment of care-seeking behaviours for LBP (outcomes)

Data on care-seeking behaviours for LBP were collected on a weekly basis over 1 year, via electronic questionnaires. Firstly, participants were asked if they experienced LBP in the past week (yes/no). Those who responded 'yes' were considered as having experienced an episode of LBP in the previous week—irrespective of whether they experienced any activity limitations due to their LBP—and were asked follow-up questions about their use of care related to their LBP. This included questions on the specific categories and types of care utilised. In this study, the different categories of care included health services and self-management strategies for LBP. Examples of each type of care are provided in Table 1. Of note, data on analgesic use for LBP were not included in this study as they have been reported separately in a previous study [9]. For each type of care utilised, participants were asked to indicate the frequency (number of days) of utilising each specific type of care (e.g. visitations to a general practitioner, use of hot packs) over the past 7 days.

The primary outcome of the study was the overall utilisation of care for LBP, defined as the total frequency (counts) of utilising any type of health services or self-management strategies, for a current episode of LBP, over 1 year.

Table 1 Care-seeking behaviours of interest

Category	Type of care
Health services for LBP	General practitioners Physiotherapists Chiropractors Emergency departments Surgical procedures 'Other' health services
Self-management strategies for LBP	Hot packs Bed rest Light exercise (e.g. walking) Hot showers Seeking information on internet and books 'Other' self-management strategies

LBP low back pain

The secondary outcomes were:

(i) Utilisation of health services for LBP: the total frequency (counts) of utilising any type of health services for a current episode of LBP, over 1 year.
(ii) Utilisation of self-management strategies for LBP: the total frequency (counts) of utilising any type of self-management strategies, for a current episode of LBP, over 1 year.

Assessment of physical activity and sedentary behaviour (explanatory variables)

Baseline volumes of sedentary behaviour, moderate-to-vigorous intensity physical activity, physical workload, and work, transport, household, and leisure domain physical activity were considered as explanatory variables. A detailed description of the methods used to assess all physical activity and sedentary behaviour variables can be found in Supplementary A. In summary, sedentary behaviour and moderate-to-vigorous intensity physical activity were assessed using an accelerometer (Actigraph GTM1/GTX3 +) [12]. Self-reported physical workload was assessed using the Physical Workload Index [13], whilst self-reported domain-specific physical activities were assessed using the International Physical Activity Questionnaire (long-form) [14].

Assessment of covariates

We considered sex, age, body mass index, smoking history, recent episode of LBP at baseline (i.e. ≤ 4 weeks prior to baseline assessment), disability, sleep quality, depression, anxiety, and stress, as possible covariates due to their potential to influence the prevalence or use of care for LBP. Data on all covariates were collected via self-reported questionnaires administered electronically at baseline. Methods of assessment are summarised in Supplementary B.

Statistical analysis

Descriptive statistics were conducted for all variables and presented as medians and interquartile ranges (IQR) due to non-normal distribution of the data. Firstly, we assessed univariable associations between covariates and each of the study outcomes. Except for sex (dichotomous), recent episode of LBP (dichotomous), and smoking history (categorical), covariates were analysed as continuous variables. To maintain statistical power, study outcomes were retained as count data. Only covariates with a p-value < 0.10 in the univariable models were included in the final regression models (Supplementary C) [15]. We then performed negative binomial regression models to determine the association between physical activity or sedentary behaviour and the study outcomes [16]. All 340 participants were included in the univariable and multivariable models, except for analyses of physical workload or work domain physical activity which excluded participants who did not have a job (paid or unpaid) at baseline.

To contrast different volumes of physical activity or sedentary behaviour, each explanatory variable was categorised into tertiles (low, medium, and high volumes), then dichotomised as low or medium-to-high volumes (Supplementary D). Low volumes were considered as the reference group.

Adjusted IRR and 95%CIs were used to describe the strength of association between the study outcomes and explanatory variables. To control for non-independence of data from complete twin pairs, a robust estimator of standard errors was used in all analyses. No data imputation was performed. Statistical significance was set at $p < 0.05$. All analyses were performed using Stata (version 17) [17].

Results

The baseline characteristics of the total study sample, with and without stratification for recent episode of LBP, are presented in Table 2. The total sample consisted of 340 participants, of which the majority were female (73%) and non-smokers (82%). Median age was 56.4 years (IQR 44.9–62.3 years), and median body mass index was 24.6 kg/m^2 (IQR 22.1–28.2 kg/m^2). Baseline levels of disability were low (Roland Morris Disability Questionnaire: median 0, IQR 0–2), despite 48% reporting a recent episode of LBP at baseline. Median total time engaged in sedentary behaviour and moderate-to-vigorous intensity physical activity at baseline was 3316 min/week (IQR 2852–3772 min/week), and 180 min/week (IQR 96–289 min/week), respectively.

A total of 160 participants (47%) reported a recent episode of LBP at baseline, with a median pain intensity of 3 (IQR 2–4) assessed on a Numeric Pain Rating Scale (where 0 indicates no pain, and 10 indicates worst possible pain). In terms of physical activity, moderate-to-vigorous intensity physical activity, leisure domain physical activity, and sedentary behaviour were slightly higher in participants who did not report a recent episode of LBP at baseline, compared with participants who did. Conversely, work and household domain physical activity levels were higher in participants who reported a recent episode of LBP at baseline, compared with participants who did not.

Overall utilisation of care for LBP

Compared with low volumes, medium-to-high volumes of sedentary behaviour at baseline were associated with

Table 2 Baseline characteristics, with and without stratification for recent episode of LBP

Characteristic	Total sample		Stratified sample			
			Recent episode of LBP[a]		No recent LBP	
	Median (IQR)	n	Median (IQR)	*n*	Median (IQR)	*n*
Age (years)	56.4 (44.9–62.3)	340	56.9 (45.1–62.3)	160	56.1 (44.9–62.5)	174
Sex (male)	27% (*n* = 92)	340	27% (*n* = 43)	160	28% (*n* = 48)	174
Body Mass Index (kg/m^2)	24.6 (22.1–28.2)	335	24.4 (21.8–27.5)	159	24.7 (22.5–28.4)	170
Zygosity		340		160		174
Monozygotic	65% (*n* = 221)		70% (*n* = 111)		61% (*n* = 106)	
Dizygotic	35% (*n* = 119)		30% (*n* = 49)		39% (*n* = 68)	
Recent episode of LBP[a]	48% (*n* = 160)	334				
Disability[b]	0 (0–2)	340	2 (0–5)	160	0 (0–0)	174
Depression[c]	2 (0–4)	340	0 (0–4)	160	2 (0–4)	174
Anxiety[c]	2 (0–4)	340	2 (0–6)	160	2 (0–4)	174
Stress[c]	6 (2–12)	340	6 (2–14)	160	6 (2–10)	174
Sleep quality[d]	6 (4–8)	187	7 (5–9)	87	6 (4–8)	99
Smoking history		337		158		173
Non-smoker	82% (*n* = 275)		82% (*n* = 129)		82% (*n* = 142)	
Ex-smoker	15% (*n* = 49)		14% (*n* = 23)		14% (*n* = 25)	
Occasional or current smoker	5% (*n* = 13)		4% (*n* = 6)		4% (*n* = 6)	
Sedentary behaviour[e]	3316 (2852–3772)	313	3300 (2799–3774)	148	3402 (2909–3743)	159
Moderate-to-vigorous intensity physical activity[e]	180 (96–289)	313	166 (98–275)	148	185 (96–311)	59
Physical Workload[f]	9 (4–15)	236	10 (4–16)	114	9 (4–16)	159
Work physical activity[g]	240 (0–2346)	251	594 (0–3900)	119	0 (0–579)	174
Transport physical activity[g]	330 (33–809)	340	321 (33–725)	160	330 (40–813)	174
Household physical activity[g]	968 (300–2490)	340	1113 (340–2750)	160	748 (270–2445)	174
Leisure physical activity[g]	729 (198–1755)	340	743 (212–1920)	160	767 (198–1680)	174

IQR interquartile range; *LBP* low back pain; *MET* metabolic equivalent of task; *min* minutes, *n* = total number of participants who provided data for each variable

[a]Recent episode of LBP, defined as experiencing LBP ≤ 4 weeks prior to completion of baseline assessment

[b]Roland Morris Disability Questionnaire; possible scores 0–24, with higher scores representing greater disability

[c]Depression Anxiety Stress Scale; possible scores for each domain 0–42, with higher scores representing higher levels of each domain

[d]Pittsburgh Sleep Quality Index; possible scores 0–21, with scores > 5 indicating poorer sleep quality

[e]Device-based measures; values are minutes/week, assessed with an accelerometer

[f]Physical Workload Index; possible scores 0–62, with higher scores indicating greater physical workload

[g]Self-reported measures; values are metabolic equivalent of task minutes per week (MET-min/week), assessed with the long-form version of the International Physical Activity Questionnaire

greater counts of overall care utilisation for LBP over 1 year (IRR 1.60, 95%CI 1.04–2.44). No other explanatory variables demonstrated any association with overall utilisation of care for LBP over 1 year (Table 3).

Utilisation of health services for LBP

No associations were found between sedentary behaviour, or different intensities or domains of physical activity, and the utilisation of health services for LBP, over 1 year (Table 4).

Utilisation of self-management strategies for LBP

Compared with low volumes, medium-to-high volumes of sedentary behaviour were associated with greater counts of utilising self-management strategies for LBP over 1 year (IRR 1.60, 95%CI 1.02–2.50). Compared with low volumes, medium-to-high volumes of household domain physical activity at baseline were significantly associated with greater counts of utilising self-management strategies for LBP over 1 year (IRR 1.62, 95%CI 1.04–2.53). No other explanatory variables demonstrated any associations with the utilisation of self-management strategies for LBP over 1 year (Table 4).

Table 3 The relationship between physical activity, sedentary behaviour, and overall care utilisation for LBP

Explanatory variable	Volume	Overall care utilisation for LBP[a]		
		IRR (95%CI)	*p*	*n*
Sedentary behaviour	Low	*Ref*		307
	Medium-to-high	1.60 (1.04–2.44)	**0.029**	
By intensity of physical activity				
Moderate-to-vigorous physical activity	Low	*Ref*		307
	Medium-to-high	0.80 (0.53–1.22)	0.297	
Physical workload	Low	*Ref*		231
	Medium-to-high	1.21 (0.68–2.15)	0.521	
By domain of physical activity				
Work	Low	*Ref*		246
	Medium-to-high	0.86 (0.55–1.34)	0.508	
Transport	Low	*Ref*		334
	Medium-to-high	0.74 (0.51–1.07)	0.109	
Household	Low	*Ref*		334
	Medium-to-high	1.43 (0.92–2.21)	0.111	
Leisure	Low	*Ref*		334
	Medium-to-high	1.13 (0.74–1.71)	0.576	

CI confidence interval; *IRR* incident rate ratio; *LBP* low back pain; *n* number of participants; *PA* physical activity; *ref* reference. Estimates in bold are significant at $p < 0.05$. Each explanatory variable was analysed in a separate model

[a]Analysed as count data and adjusted for age, sex, recent episode of LBP, disability, and stress

Table 4 The relationship between physical activity, sedentary behaviour, and the utilisation of health services or self-management strategies for LBP

Explanatory variable	Volume	Utilisation of health services for LBP[a]			Utilisation of self-management strategies for LBP[b]		
		IRR (95%CI)	*p*	*n*	IRR (95%CI)	*p*	*n*
Sedentary behaviour	Low	*Ref*		307	*Ref*		307
	Medium-to-high	0.76 (0.37–1.58)	0.468		1.60 (1.02–2.50)	**0.040**	
By intensity of physical activity							
Moderate-to-vigorous physical activity	Low	*Ref*		307	*Ref*		307
	Medium-to-high	1.55 (0.70–3.42)	0.277		0.70 (0.46–1.08)	0.106	
Physical workload	Low	*Ref*		231	*Ref*		231
	Medium-to-high	0.94 (0.40–2.22)	0.885		1.44 (0.82–2.53)	0.203	
By domain of physical activity							
Work	Low	*Ref*		246	*Ref*		246
	Medium-to-high	1.22 (0.58–2.60)	0.602		0.91 (0.58–1.41)	0.668	
Transport	Low	*Ref*		334	*Ref*		334
	Medium-to-high	1.27 (0.64–2.53)	0.503		0.77 (0.52–1.13)	0.182	
Household	Low	*Ref*		334	*Ref*		334
	Medium-to-high	0.64 (0.28–1.48)	0.297		1.62 (1.04–2.53)	**0.032**	
Leisure	Low	*Ref*		334	*Ref*		334
	Medium-to-high	0.63 (0.30–1.34)	0.234		1.16 (0.75–1.80)	0.505	

CI confidence interval; *IRR* incident rate ratio; *LBP* low back pain; *n* number of participants; *PA* physical activity; *ref* reference. Estimates in bold are significant at $p < 0.05$. Each explanatory variable was analysed in a separate model

[a]Analysed as count data and adjusted for sex, recent episode of LBP, and disability

[b]Analysed as count data and adjusted for sex, recent episode of LBP, disability, and stress

Discussion

Our study demonstrated that people who engaged in medium-to-high baseline volumes of sedentary behaviour utilised 1.6 times more overall care and self-management strategies for LBP over 1 year. Also, people engaged in medium-to-high baseline volumes of household domain physical activity (e.g. housework, gardening, yard work, general maintenance, caring for family members) utilised 1.6 times more self-management strategies, for LBP, over 1 year. Other types and domains of physical activity did not appear to impact the utilisation of health services for LBP over 1 year.

Previous related studies have mostly relied on self-reported measures of physical activity [7, 8] and have only assessed health care utilisation retrospectively with limited definitions for health care utilisation for LBP [7–9]. As a result, comparison with these studies was difficult. Instead, we contrasted our findings to existing literature examining the association between physical activity or sedentary behaviour and the prevalence or risk of LBP.

Previous studies have demonstrated conflicting findings for sedentary behaviour and risk of LBP. Balling et al. (2019) [18] found no association between sedentary behaviour and LBP (hazard ratio 0.99, 95%CI 0.86–1.16), whilst Amorim et al. [19] identified an association which only exists in females (odds ratio 1.50, 95%CI 1.16–1.91). Our findings (Table 3) were similar to Amorim et al. [19]. We acknowledge that an overrepresentation of females in our study (73%) may have influenced our results. However, with growing evidence confirming that sedentary behaviour is an independent risk factor for the incidence of chronic diseases (e.g. cardiovascular disease, cancers) and mortality [20], our findings are unsurprising—people who engage in higher levels of sedentary behaviour appear to experience more complicated recovery from LBP (i.e. require greater use of care).

Moreover, previous studies have demonstrated a positive association between heavy household physical activity and risk of LBP [21, 22]. In our study, we identified a positive relationship between household domain physical activity and the use of self-management strategies for LBP. Considering that people with LBP commonly report difficulties with performance of household duties (i.e. disability in performing home chores or gardening) [23] and fulfilment of social roles [24], we hypothesise that experiencing worse role limitations in the household setting may precipitate greater utilisation of care for LBP.

Further, it has been consistently shown that higher engagement in physically demanding work (e.g. strenuous work [25], excessive occupational standing [26]), lead to increased risk or prevalence of LBP. There is also evidence indicating an inverse relationship between moderate-to-vigorous intensity physical activity and the prevalence of LBP [27]. We did not find associations between either variable and the use of care for LBP, although the direction of the IRRs was consistent for our primary outcome (Table 3). We could not compare our findings for transport domain physical activity due to an absence of previous studies [27].

Clinical implications

Physical activity is consistently recommended as first-line treatment for patients with chronic LBP; however, current guidelines only provide limited information to support implementation in clinical practice [28]. Although some guidelines provide suggestions on the modalities of physical activity (e.g. aerobic, strength training, endurance) which should be recommended to patients with LBP [28], clear information regarding beneficial or harmful volumes of sedentary behaviour, or physical activity performed across different settings or intensities, is grossly lacking. In our study, we identified that engagement in higher baseline volumes of sedentary behaviour or physical activity in the household setting (e.g. housework, gardening, yard work, general household maintenance) may be harmful for LBP. We did not identify any intensities, volumes, or domains of physical activity which had clear benefits for LBP in our study. Given that sedentary behaviour and physical activity are modifiable risk factors, where feasible, patients and clinicians should collaborate to develop strategies to reduce engagement in harmful (high) volumes of sedentarism and physical activity in the household setting (e.g. domestic labour), as these factors may predispose individuals to poorer and more complex recovery from LBP.

Possible strategies to reduce sedentary behaviour include self-monitoring of prolonged sitting or driving times, restructuring of social or physical environments, cognitive behavioural therapy strategies such as problem-solving [29], or use of activity-prompting devices [30]. However, we acknowledge that reducing the overall volume of sedentary time may be challenging for individuals with occupations involving prolonged periods of sitting (e.g. office workers) or driving (e.g. bus and truck drivers). Similarly, reducing the overall volume of physical activity in the household setting (e.g. housework, gardening) may not be practical for some individuals, as such activities are often linked with domestic and familiar responsibilities (i.e. caring for children or elderly family members). As opposed to an absolute reduction in the volume of physical activity performed in the household setting, possible strategies to modify patterns of engaging in domestic labour may include graded activity [31], or if feasible, delegation of physically demanding tasks amongst capable household members.

Ultimately, the severity of a patient's symptoms (e.g. pain intensity, extent of activity limitation), sociocultural roles and occupational demands, and other contextual factors (e.g. history of traumatic events, comorbidities) should be considered when devising appropriate behaviour change strategies in people with LBP.

Strengths and limitations

This study has several strengths. Firstly, the AUTBACK study utilised device-based measures of moderate-to-vigorous intensity physical activity and sedentary behaviour. This is methodologically advantageous as self-reported physical activity data are prone to bias or misclassification. Although we encountered missing data (e.g. differences in the total number of weekly questionnaires completed by participants over 1 year), a common issue in longitudinal studies involving frequent repeated measures, the overall response rate in our study was high (94%) and the use of mixed models accounted for differences in response rates between participants. We also assessed, longitudinally, a diverse range of commonly utilised health services or strategies for managing LBP, allowing us to perform disaggregated analyses based on the overall utilisation of care, the utilisation of health services only, and the utilisation of self-management strategies only, for LBP.

This study has some limitations. Firstly, we utilised self-reported measures of domain-specific physical activity in the absence of reliable device-based methods to separately assess these domains. Secondly, it has been shown that in most countries, regional areas have fewer health services available per capita when compared with urban areas [32]. Disparities in the distances travelled to access health services between urban and rural populations are also well known. Whilst the AUTBACK study recruited participants from Australia-wide, including urban and rural areas, analyses were not adjusted for the geographical location of participants as the necessary data were not available for the current study. This should be explored in further studies. Furthermore, we acknowledge that income differences between those living in urban versus rural areas in Australia [33] and globally, could potentially impact engagement in physical activity [34] as well as care-seeking behaviours [33]. Due to a lack of available data, we did not adjust for income differences in our analyses.

In addition, whilst we adjusted our analyses for sex, we lacked statistical power to perform sex-disaggregated analyses. Sex and/or gender differences in the prevalence [35], severity [36], and utilisation of care for LBP [6, 37] are well-established and may contribute to disparities in exposures to physical workload and domestic labour, or engagement in physical activity. Further, whilst we adjusted our analyses for baseline disability levels and the presence of LBP within the past four weeks before baseline, we did not adjust for the potential confounding influence of symptom severity (e.g. pain intensity or activity limitation), traumatic events (no available data), or episode recovery (no available data). These factors could potentially impact the frequency and type of care sought for LBP and should be evaluated in future studies. Moreover, we lacked statistical power to compare patterns of using specific types of self-management strategies for LBP. Consequently, we were unable to examine whether individuals with active lifestyles were more or less likely to use self-management strategies which are consistent with guideline recommendations for LBP, compared to individuals with sedentary lifestyles. Future studies should explore this relationship further to guide clinical practice (e.g. providing targeted education to those more likely to use ineffective self-management strategies for LBP). Finally, data on physical activity and sedentary behaviour were only assessed at baseline. Future studies should examine whether changes in physical activity levels or sedentary behaviour over time can influence care-seeking behaviours for LBP.

Conclusion

Compared with those engaged in lower volumes, people who engage in higher baseline volumes of sedentary behaviour or physical activity in the household setting (e.g. housework, gardening, yard work, general household maintenance) utilise 1.6 times more care for LBP over 1 year. Given that greater utilisation of care may indicate poorer recovery from LBP, findings suggest that engaging in higher baseline volumes of these behaviours are potentially harmful for LBP. We did not identify any intensities, volumes, or domains of physical activity with clear benefits for LBP. All in all, patients and clinicians should collaborate to screen and develop strategies to reduce engagement in sedentary behaviour and physical activity performed in the household setting. If a reduction in the overall volume of engaging in these behaviours is not feasible, implementation of strategies to modify patterns of engagement may be a suitable alternative. Contextual factors (e.g. patient symptom severity, sociocultural roles, occupational demands) should be considered when devising appropriate behaviour change strategies. Future studies should compare patterns of using specific types of self-management strategies for LBP between individuals with more sedentary or active lifestyles and also investigate whether changes in physical activity levels or sedentary behaviour over time are associated with care-seeking behaviours for LBP, to further inform clinical practice.

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Data Availability The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Conflict of interest The authors have no competing interests to declare that are relevant to the content of this article.

Ethics approval All study procedures were approved by Twins Research Australia and the University of Sydney Human Research Ethics Committee (Project No: 2015/407).

Consent participant All participants provided informed consent prior to data collection.

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