Concise report

Physical activity guidelines: is the message getting through to adults with rheumatic conditions?

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Abstract

Objectives. This study examines the awareness and self-report knowledge of physical activity (PA) guidelines among adults with rheumatic conditions and evaluates rates of adherence to PA recommendations. Secondary aims include (i) investigating perceived benefits and barriers to exercise and (ii) exploring correlates associated with PA.

Methods. This cross-sectional study involved adults attending an outpatient rheumatology clinic completing a questionnaire. Closed- and open-ended questions enquired about awareness and knowledge of PA guidelines, and a single-item self-report measure of PA was included. Perceptions of exercise were assessed using the Exercise Benefits and Barriers Scale. Descriptive statistics described participant characteristics and age-adjusted bivariate analyses explored associations between socio-demographic and condition-related factors and PA.

Results. A total of 401 adults (134 males, 267 females) completed the questionnaire. Only 17.6% of respondents were aware of national PA guidelines and 17.4% accurately identified the frequency and duration of the recommendations. A quarter of respondents (26.7%) reported adherence to the guidelines, while 30.5% reported no weekly PA. Higher perceived benefits and lower perceived barriers to exercise were positively associated with PA behaviour.

Conclusion. A large majority of respondents were not aware of PA guidelines and self-report knowledge of PA recommendations was largely inaccurate. Despite the role of PA in health promotion and in the management of rheumatic conditions, adherence to PA recommendations was low. Level of education, perceived benefits and barriers to exercise, and awareness and self-report knowledge of PA guidelines are associated with PA behaviour.

Key words: rheumatology, physical activity, health promotion, patient education, exercise, barriers, adherence.

Introduction

Physical activity (PA) and exercise are, along with pharmacology, key components of the clinical practice guidelines for the management of a variety of rheumatic conditions [1, 2]. In addition to disease-specific benefits in physical and psychological status, PA has been shown to reduce the risk of cardiovascular disease, obesity, some cancers (colon and breast), type 2 diabetes and osteoporosis in the general population [3]. It also improves musculoskeletal health and reduces symptoms of depression.

National guidelines were developed to quantify the volume and type of PA adults should aim to achieve. The UK guidelines recommend that adults obtain at least 150 minutes of moderate-intensity physical activity (PA_{mod}) per week, in bouts of activity lasting $\geqslant 10$ minutes [4]. The Irish guidelines state that adults should perform at least 30 minutes of PA_{mod} per day, 5 days per week [5]. Alternatively, weekly PA recommendations may be met by performing 75 minutes of vigorous-intensity physical activity (PA_{vig}) or by combining PA_{mod} and PA_{vig}. In addition, strengthening exercises are recommended for all adults, while balance and coordination exercises are

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recommended for adults >65 years of age. Although PA guidelines have formed the basis of public health promotion campaigns, little is known of the awareness and understanding of these guidelines among specific patient groups.

Adherence to PA recommendations among adults with rheumatic conditions is unclear, varying internationally and across conditions [6, 7]. Determinants of adult participation in PA are numerous and fall broadly into personal, social and environmental factors. Among the personal factors influencing PA are perceived benefits and barriers to exercise [8].

The aim of this study was to determine the awareness and knowledge of, and adherence to, PA guidelines among patients with rheumatic conditions. Secondary aims were to (i) investigate the perceived benefits and barriers to exercise and (ii) explore socio-demographic and condition correlates associated with PA.

Materials and methods

A cross-sectional, questionnaire-based approach was used in this study. Recruitment was conducted in the outpatient rheumatology clinics of St James's Hospital, Dublin. Data collection took place over 8 weeks from July to September 2013. All participants attending the clinics were considered for inclusion. Eligibility criteria included being >18 years of age and capable of understanding an English-language questionnaire. A gatekeeper in the rheumatology clinic, who was neither part of the research team nor the treating physician, identified potential participants. Written informed consent was obtained prior to the questionnaire being administered, in accordance with the Declaration of Helsinki. A research assistant was available to participants requesting assistance due to literacy, visual or manual difficulties. Approval for this study was granted by the St James's Hospital/The Adelaide and Meath Hospital, Dublin, Incorporating the National Children's Hospital (SJH/AMNCH) Research Ethics Committee, Dublin.

Participant characteristics, including age, gender, employment status, highest level of education, marital status and smoking status, were self-reported. Participants also specified whether it was their first visit to the rheumatology clinic, their diagnosis, time since diagnosis and any other co-morbidities preventing PA.

Awareness and knowledge of PA guidelines

Three questions derived from a similar study of awareness and knowledge of PA guidelines were posed [9]. The first asked whether participants were aware of guidelines for PA. Two open-ended questions asked respondents what the recommended weekly frequency and duration of PA for the average adult to stay healthy is. We created separate variables to identify accurate knowledge of the Irish PA_{mod} guidelines. Frequency was re-categorized as 5–7 days (accurate) and <5 days (inaccurate). Duration was categorized as $\geqslant$30 min (accurate) and <30 min (inaccurate). Those reporting both accurate frequency and

duration were categorized as having accurate knowledge of the national guidelines.

The recommendations also specify a target for PA_{vig} of 75 min/week. To allow for this interpretation, we created an alternate PA_{vig} variable; knowledge was deemed accurate when weekly PA volume was $\geqslant$75 min.

Adherence to PA guidelines

Adherence to PA guidelines was measured using a single-item measure developed by Milton et al. [10]. Criterion validity was established to be fair against accelerometry [11]. This measure has shown strong repeatability and moderately strong concurrent validity against the Global Physical Activity Questionnaire and the UK Active People Survey [10].

Perceived benefits and barriers to exercise

The Exercise Benefits and Barriers Scale (EBBS) was used to assess participant's perception of exercise [12]. The EBBS was initially developed and validated in a healthy adult population and subsequently used in patient populations. The scale includes 29 benefits items and 14 barriers items. Respondents rate their agreement with each item on a 4-point Likert scale ranging from strongly disagree to strongly agree. Possible total scores range from 43 to 172, and higher scores indicate a more positive perception of exercise. Distinct subscores for perceived benefits and perceived barriers range from 29 to 116 and 14 to 56, respectively; higher scores indicate higher awareness of either the benefits or barriers.

Statistical methods

An a priori sample size calculation was completed based on the study by Manning et al. [13]. They reported that the proportion of participants who met the PA criteria was 0.545. Using this proportion and setting precision at 10%, it was estimated that 382 participants would be needed. Basic descriptive statistics described patient characteristics (reported as frequency and percentage for categorical variables and mean and standard deviation for continuous variables). Age-adjusted associations were tested using a series of logistic regression models between socio-demographic and condition-related factors and PA. For all analyses, $P \leqslant 0.05$ (two-tailed) was taken as statistically significant. All statistical analysis was conducted on SPSS for Windows version 21 (IBM, Armonk, NY, USA).

Results

A total of 401 participants completed the questionnaire, representing 94.4% of the total number of patients attending the clinic ($n = 425$). Four patients did not meet the eligibility criteria for the study and 20 declined to participate. Descriptive characteristics of the sample are provided in Table 1.

Awareness of the existence of PA guidelines among respondents was 17.6%, while 17.4% of respondents accurately identified the frequency and duration of the

TABLE 1 Characteristics of the study sample (n = 401)

	n (%)
Gender	
Male	134 (33.4)
Female	267 (66.6)
Age, mean (s.d.) [range], years	56.4 (15.72) [18–95]
Employment status, n (%)	
Employed full-time	93 (23.2)
Employed part-time	40 (10.0)
Not working	101 (25.2)
Retired	153 (38.2)
Student	14 (3.5)
Education completed, n (%)	
Primary	144 (35.9)
Secondary	144 (35.9)
Tertiary	113 (28.2)
Marital status, n (%)	
Single	96 (23.9)
Married	214 (53.4)
Separated	29 (7.2)
Divorced	15 (3.7)
Widowed	47 (11.7)
Smoking habit, n (%)	
Non-smoker	206 (51.4)
Smoker	79 (19.7)
Former smoker	116 (28.9)
Self-report primary diagnosis, n (%)	
RA	193 (48.1)
SpA	30 (7.5)
FM	21 (5.2)
CTD	21 (5.2)
OA	18 (4.5)
Gout	5 (1.2)
Other	17 (4.2)
Unknown	96 (23.9)
Disease duration, mean (s.d.) [range], years	8.0 (10.9) [0–55]
Self-report co-morbidities limiting PA (n = 399), n (%)	
No	243 (60.9)
Yes	156 (39.1)

PA: physical activity.

PA_{mod} recommendations. Of the respondents who were aware of PA guidelines, 40.0% had accurate self-report knowledge of the PA_{mod} recommendations; just 12.6% of respondents who were unaware of PA guidelines had accurate knowledge of the recommendations. When self-report knowledge of PA guidelines was based on PA_{vig} criteria, 33.1% of respondents accurately reported the recommendations.

Self-reported adherence to PA guidelines was 26.7%, with 73.3% non-adherent (30.5% reported no weekly PA). Mean total EBBS score was 127.6 points (s.d. 14.9). Mean EBBS scores for benefits and barriers subscales were 86.7 points (s.d. 11.6) and 29.1 points (s.d. 5.5), respectively.

In age-adjusted bivariate analyses employment status, EBBS scores (total and benefits), education completed and accurate knowledge of guidelines were associated with awareness of PA guidelines (see Table 2).

Education completed, EBBS total score, awareness of PA guidelines and adherence to PA guidelines were associated with accurate self-report knowledge of the PA_{mod} guidelines. Accurate self-report knowledge of guidelines and EBBS scores (total and subscores) were associated with adherence to PA recommendations.

Discussion

Despite public health promotion campaigns, awareness of PA guidelines among adults with rheumatic conditions is low (17.6%), while awareness of PA recommendations in the general population is more than two-thirds (68.4%) [14]. Factors associated with lower awareness of PA guidelines (after adjusting for age) included leaving school before completing the third level, being retired and having a lower perception of the benefits of exercise and a greater awareness of the barriers to exercising. Exploring the context and medium through which respondents became aware of guidelines would inform future public health campaigns and help target subgroups not being reached by current strategies.

Overall, 17.4% of respondents accurately reported both the duration and frequency of PA_{mod} recommendations. Being aware of PA guidelines was associated with a 4-fold increase in accurate self-reported knowledge of PA recommendations. A higher level of completed education, higher perceived benefits of exercise and lower perceived barriers to exercise were also associated with accurate knowledge of recommendations. The level of knowledge of PA recommendations observed is lower than the levels found in the general UK and US adult populations (39% and 33%, respectively) [9, 14].

The rate of adherence to PA_{mod} recommendations was 26.7%, with 30.5% of respondents reporting no weekly PA. This is lower than the adherence rates reported by patients with rheumatic conditions in the UK and the USA (55% and 38%, respectively) [6, 13]. This is also lower than rates of adherence reported in the general Irish population (55%) [15]. Physical inactivity has been identified as the fourth leading risk factor for global mortality [3], and the relative inactivity of this cohort is a concern. Having accurate knowledge of the guidelines was positively associated with adherence to PA_{mod} guidelines. EBBS scores were also associated with adherence.

Health care professionals (HCPs) are in a position to inform patients regarding PA and, when appropriate, implement strategies aimed at behavioural change. Providing information on PA may be an early stage of achieving behaviour change. Although HCPs report positive attitudes towards PA and include it as part of their case management, approximately half of adults attending rheumatology clinics in the UK and USA reported that PA had never been discussed with them [13, 16, 17]. Additionally, HCPs working in rheumatology may benefit from further training in exercise advice and PA promotion, as they report lacking skills and confidence in these areas [16, 18].

Table 2 Predictors of awareness of, self-report knowledge of and adherence to guidelines for PA$_{mod}$

	Awareness of PA guidelines		Knowledge of PA$_{mod}$ guidelines		Adherence to PA$_{mod}$ guidelines	
	Age-adjusted OR (95% CI)	P-value	Age-adjusted OR (95% CI)	P-value	Age-adjusted OR (95% CI)	P-value
Gender						
Male	Reference		Reference		Reference	
Female	1.172 (0.67, 2.06)	0.582	1.38 (0.76, 2.47)	0.288	0.66 (0.41, 1.06)	0.087
Employment						
Full-time	Reference		Reference		Reference	
Part-time	0.36 (0.13, 1.05)	0.061	0.43 (0.15, 1.24)	0.117	0.84 (0.36, 2.12)	0.716
Not employed	0.51 (0.25, 1.05)	0.069	0.53 (0.25, 1.10)	0.089	0.80 (0.39, 1.65)	0.549
Student	1.12 (0.31, 4.00)	0.862	1.5 (0.46, 4.93)	0.504	2.94 (0.82, 10.49)	0.097
Retired	**0.32 (0.13, 0.81)**	**0.016**	0.54 (0.21, 1.35)	0.187	0.62 (0.27, 1.45)	0.271
Education						
Primary	Reference		Reference		Reference	
Secondary	2.09 (0.97, 4.53)	0.062	**2.56 (1.11, 5.89)**	**0.027**	1.30 (0.71, 2.38)	0.403
Tertiary	**4.68 (1.88, 11.64)**	**0.001**	**3.55 (1.34, 9.40)**	**0.011**	1.80 (0.82, 3.94)	0.140
Marital status						
Single	Reference		Reference		Reference	
Married	1.18 (0.59, 2.36)	0.645	1.23 (0.61, 2.46)	0.569	0.72 (0.38, 1.37)	0.314
Separated	0.17 (0.21, 1.35)	0.093	0.37 (0.08, 1.74)	0.209	0.65 (0.23, 1.87)	0.425
Divorced	2.38 (0.69, 8.17)	0.169	2.02 (0.54, 7.47)	0.294	0.84 (0.23, 3.02)	0.783
Widowed	0.57 (0.15, 2.11)	0.399	0.92 (0.24, 3.51)	0.906	0.60 (0.23, 1.57)	0.301
Smoking status						
Non-smoker	Reference		Reference		Reference	
Smoker	0.61 (0.30, 1.27)	0.189	0.97 (0.49, 1.91)	0.920	1.47 (0.78, 2.76)	0.230
Former-smoker	0.64 (0.34, 1.21)	0.172	0.80 (0.42, 1.54)	0.506	1.54 (0.91, 2.62)	0.108
Awareness of guidelines						
Not aware	NA		Reference		Reference	
Aware	NA		**4.42 (2.44, 8.02)**	**<0.0001**	1.31 (0.73, 2.38)	0.366
Self-report knowledge of guidelines						
Inaccurate	Reference		NA		Reference	
Accurate	**4.39 (2.42, 7.96)**	**<0.0001**	NA		**2.58 (1.43, 4.65)**	**0.002**
Adherence to PA guidelines						
Not meeting	Reference		Reference		NA	
Meeting	1.31 (0.720, 2.37)	0.373	**2.66 (1.47, 4.82)**	**0.001**	NA	
EBBS						
Total	**1.03 (1.01, 1.05)**	**0.003**	**1.02 (1.00, 1.04)**	**0.037**	**1.03 (1.01, 1.05)**	**0.019**
Benefits	**1.04 (1.01, 1.06)**	**0.005**	1.02 (1.00, 1.05)	0.075	**1.02 (1.00, 1.05)**	**0.042**
Barriers	0.95 (0.90, 1.00)	0.052	0.95 (0.90, 1.00)	0.062	**0.95 (0.91, 1.00)**	**0.043**
First attendance clinic						
Yes	Reference		Reference		Reference	
No	1.29 (0.66, 2.52)	0.451	0.75 (0.41, 1.39)	0.365	1.03 (0.58, 1.84)	0.913
Disease duration	1.01 (0.98, 1.03)	0.532	0.98 (0.95, 1.01)	0.219	0.99 (0.97, 1.02)	0.604
Co-morbidities						
No	Reference		Reference		Reference	
Yes	0.68 (0.39, 1.21)	0.192	0.71 (0.40, 1.28)	0.257	0.85 (0.52, 1.38)	0.503

Bold text denotes statistically significant difference compared with the reference category (*P* < 0.05). PA$_{mod}$: moderate-intensity physical activity; PA: physical activity; OR: odds ratio; NA: not applicable; EBBS: Exercise Benefits and Barriers scale.

In this study almost 40% of respondents reported having one or more co-morbidities preventing their involvement in PA. However, the majority of these conditions would not be considered contraindications to PA. It is recommended that older adults with medical conditions engage in PA in a manner that effectively and safely treats their condition and prevents the development of other chronic diseases [19]. However, guidelines for the management of rheumatic conditions do not contain specific guidance on PA.

Study limitations

This study did not discriminate between PA$_{mod}$ and PA$_{vig}$ when enquiring about self-report knowledge of, and

adherence to, PA. Our results may underestimate knowledge and adherence to guidelines if respondents were reporting PA_{vig} rather than PA_{mod}. The accuracy of self-report knowledge of guidelines almost doubles (from 17.4% to 33.1%) when the former criteria are used. Furthermore, there is a tendency for self-report questionnaires to overestimate PA compared with other methods, such as accelerometry [20].

Recruitment was undertaken from a large urban hospital, the catchment area of which has specific environmental, cultural and socio-economic properties that restrict comparisons with other populations. Despite this, the associations of education level achieved, work status and perceived benefits and barriers to exercise were in line with previous literature [8]. In addition, awareness of PA guidelines and accurate self-report knowledge of PA recommendations are determinants associated with PA not previously identified as influencing PA behaviour.

Conclusions

Awareness of PA guidelines in patients attending a rheumatology clinic is low. Among this cohort there is a lack of self-report knowledge of PA recommendations and self-reported rates of adherence to PA are below those of the general population. Level of education, work status, perceived benefits and barriers to exercise and awareness and self-report knowledge of PA guidelines are associated with adherence to PA recommendations.

Rheumatology key messages

- Fewer than one in five adults with rheumatic disease in Ireland is aware of physical activity guidelines.
- Knowledge of physical activity guidelines in adults with rheumatic conditions is low.
- The majority of adults with rheumatic disease do not meet physical activity recommendations.

Acknowledgements

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