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MANUSCRIPT

Title

An exploration of physical activity and well-being in university employees

Abstract

Aims

The aim was to explore levels of physical activity and mental well-being in university employees, as well as barriers to and incentives for workplace physical activity.

Methods

An electronic survey was distributed to all staff at one UK University. The survey consisted of: Physical activity stages of change questionnaire; international physical activity questionnaire (short-form); Warwick-Edinburgh Mental Well-being Scale (WEMWBS); questions on perceived barriers to and incentives for workplace physical activity; questions on methods of enhancing employee well-being; demographics. A self-selected sample participated in two focus groups to explore key themes arising from the survey. Descriptive statistics were reported for survey data; associations between physical activity and well-being were tested for using Kruskal-Wallis with

post-hoc Mann-Whitney. Descriptive, thematic analysis was performed on focus group transcripts.

Results

502 surveys were completed (34% response rate); thirteen staff participated in focus groups. 42% of the sample reported physical activity below the recommended guideline amount. Females were less active than males ($p < 0.005$). The mean WEMWBS was 49.2 (95%CI 48.3 – 49.9). Low physical activity levels were related to lower WEMWBS scores, with statistically significant differences in WEMWBS demonstrated between low and moderate physical activity ($p, 0.05$) and low and high physical activity ($p, 0.001$). Lack of time and perceived expense of facilities were common barriers to workplace physical activity. The main focus group finding was the impact of university culture on workplace physical activity and well-being.

Conclusions

University staff demonstrate physical activity levels and a relationship between physical activity and well-being similar to the general population. Carefully designed strategies aimed at enhancing physical activity and well-being in university staff are required. The specific cultural and other barriers to workplace physical activity that

exist in this setting should be considered. These results are being used to inform such interventions whose effectiveness will be evaluated in future research.

Key Words

Physical Activity; Well-being; Workplace health; University employees; Survey; Focus groups

Introduction

Physical activity (PA) has well-documented benefits, and regular participation in moderate intensity PA can improve overall health¹ and mental health,²⁻³ and reduce the risk of chronic diseases such as heart disease, stroke, type 2 diabetes and some common cancers.¹ It is estimated that physical inactivity is the principal cause for a proportion of non-communicable diseases,⁴ which account for almost half the global burden of disease.⁵ Guidelines recommend that adults should accumulate 150 minutes or more of moderate intensity PA per week;^{6,7} up to 33% of men and 45% of women in the United Kingdom do not currently meet these recommendations.⁸⁻⁹

Increasingly, workplace PA and wellness programmes are being used to improve employee health, absenteeism, stress tolerance and productivity, thereby enhancing overall well-being.¹⁰ This is in keeping with the World Health Organization's (WHO) "Health for all" strategy,¹¹ with UK Government policy on improving the health and well-being of the working-age population,¹² and with the workplace being a well-established health promotion setting, with a recent systematic review providing evidence of return on investment from health promotion programmes.¹³ The decline in PA levels and the increase in sedentary lifestyles across all age groups is a concern for employers and health professionals alike. The challenge is to effectively promote

the potential health and well-being benefits of increasing workplace PA. These messages can be simple and research is demonstrating that the use of incentives to attract employees into workplace health promotion programmes can be successful,¹⁴ with small increases in PA and reductions in sedentary behaviour within the workplace being important.¹⁵

The evidence from systematic reviews on workplace programmes suggests that PA interventions may be effective¹⁶ and may reduce sickness absence.¹⁷ It has been suggested that workplace PA interventions may be most effective when combined with other dimensions such as weight or nutrition.¹⁸ However, the authors of these reviews all agree that there is a need for further high quality research before conclusions are drawn.

University employees represent a population at risk from a sedentary working pattern,¹⁹ and wellness programmes within universities are becoming more common.^{14, 20-22} University employees are a relatively under-researched population in terms of workplace health promotion with the primary focus to date being student health and well-being.²³ University employees are in a unique position to positively influence not only their own, but also their students' lifestyle choices; therefore it could be suggested that their workplace health behaviours are particularly important.

Of the research to date on university employees, some has focussed on nutrition,²⁴⁻²⁵ but the majority has focussed on PA. Rissel et al,²⁶ in a survey of active travel in staff and students at Sydney university, reported that only 41% were sufficiently active according to PA guidelines. Agha and Al-Dabbagh,²⁷ in a survey of school, college and university staff in Iraq, found that support staff were less active than teaching staff, and those with the greatest sitting times were the least physically active overall.

Walking is the most common workplace programme to have been evaluated within universities, and it has been found to be effective at increasing PA, particularly in those who are least active at baseline.^{20, 22, 28-29} Walking programmes have been found to have beneficial effects on fatigue, vitality, health, and work performance,³⁰ and on the general health and wellness of university employees.³¹ Stair climbing in the university setting has also been shown to be positively affected, in the short-term, by a promotional signage intervention.³²

There are however barriers to participating in workplace PA, which were recently studied in Australian male university employees as part of a workplace PA intervention.²² Time and workload were common reasons for not being physically active, as well as factors outwith the workplace such as commuting, family responsibilities and the cost of facilities. Addressing either environmental (time) or

cognitive (providing PA education) barriers has been shown to be effective at increasing PA in nonfaculty employees in the USA.²¹

In summary, the research to date on university employees has largely focussed on walking interventions with only two studies being conducted in the UK setting, both of which have concerned such interventions.^{28,30} Moreover, there may be barriers to the implementation and uptake of workplace interventions in the university setting.

Finally, much of the research to date has focussed on physical health outcomes, with fewer studies concerning wider well-being such as anxiety³³ and stress, which is reported to be prevalent in university employees.³⁴⁻³⁵ This is surprising given the well documented relationship between PA and mental well-being.³ In order to inform the development of an appropriate and feasible workplace intervention that will positively affect both PA and well-being in the context of a UK university, this study explored levels of PA and well-being in university employees, as well as barriers and incentives to participating in workplace PA, and strategies for enhancing wider physical and mental well-being.

Methods

Ethical approval for the study was granted by [University to be inserted] School of Health Sciences ethics review panel. A mixed-methods approach was taken involving both survey and focus group methods.

Survey

An anonymous electronic survey was distributed to all staff at one HEI in the UK via staff e-mails and the university's weekly electronic bulletin. Staff who were responsible for line-managing those without access to e-mail distributed paper copies of the survey, which were submitted anonymously to drop-boxes across campus. The survey included the following measures: (i) Demographic details including age, gender and employment-related information, (ii) Self-reported PA status (PA stages of change questionnaire),³⁶ (iii) Self-reported PA over the past seven days (international PA questionnaire (IPAQ), short form),³⁷ (iv) Mental well-being (Warwick-Edinburgh Mental Well-being Scale (WEMWBS)).³⁸ The PA and well-being measures were selected due to their documented psychometric properties³⁹⁻⁴⁰ and suitability for electronic distribution.^{26,41} Both the IPAQ and WEMWBS are sensitive to change and suitable for surveillance of PA and well-being following health promotion interventions, therefore it will be possible to compare the current data to that collected in the future, in order to evaluate the effect of the work-based health

promotion strategies that are developed as a result of this research. The survey also included items on perceived barriers and incentives to PA, and suggestions for ways of enhancing employee well-being. These dimensions were collected using items designed specifically for this study, informed by the literature and individualised to the local context, consisting of a combination of closed and open response questions (see supplementary file 1). The survey was collected using SurveyMonkey®, was open for one month, with an e-mail reminder two weeks following the initial invitation.

Focus Groups

In order to preserve anonymity of the survey data, participants were asked to e-mail the research team if they were interested in participating in focus groups. Two focus groups, conducted by the authors, explored, in more depth several aspects related to workplace PA and well-being including: (i) the meaning of workplace well-being, (ii) the role of PA in maintaining/enhancing workplace well-being, (iii) the barriers and incentives to workplace well-being and PA suggested in the survey responses, and (iv) participants' perceptions of suggested methods of enhancing workplace well-being that arose from the survey data. The focus groups lasted 1.5 – 2 hours, were audio-recorded and transcribed verbatim, by a researcher independent to the study team, with the exception of sections of the focus groups where participants split into two

groups to discuss and rank their agreement with the survey responses to barriers to PA and suggestions for enhancing well-being. The notes made by the authors during these sections were included in the data analysis.

Data analysis

Survey

Descriptive statistics were calculated using frequencies for categorical variables and mean \pm 95% confidence intervals (CI) for continuous variables. Associations between PA and well-being were tested for using Kruskal-Wallis with post-hoc Mann-Whitney, $\alpha = 0.05$. Open response questions were themed.

Focus Groups

A coding index was generated and applied to the data, and descriptive, thematic analysis was performed.

Results

Quantitative Data

Five hundred and two surveys were completed (487 electronic, 15 paper), representing a 34% response rate. Table 1 describes the participants and compares the sample to

the HEI's staff statistics, demonstrating that the sample was broadly similar to the wider staff group in terms of age, gender and employment type. Stage of change is presented in figure 1, demonstrating that 42% of the sample reported activity levels below the recommended guidelines. The IPAQ results are in contrast with stage of change; 23% of staff reported low PA, with the remainder reporting moderate (39%) or vigorous (38%) PA. It should be noted that all participants completed the stage of change question, whereas IPAQ data was available for 62% of the sample, due to incomplete or missing data. Table 2 describes PA by gender and employment type; there were statistically significant differences in levels of low and high PA between males and females ($p < 0.005$). There was a difference in moderate PA levels between academic and professional/support staff, however this did not reach statistical significance ($p = 0.057$). The mean WEMWBS score for the sample was 49.2 (95% CI 48.3 – 49.9). Table 3 describes the relationship between PA (IPAQ) and well-being (WEMWBS); low PA levels were related to lower WEMWBS scores, with statistically significant differences in WEMWBS scores between low and moderate PA ($p < 0.05$) and low and high PA ($p < 0.001$).

Table 4 demonstrates that lack of time and perceived expense of facilities were the most common barriers to workplace PA. Other barriers included both personal (e.g. lack of energy, PA boring/not enjoyable) and environmental factors (e.g. nowhere

convenient for exercising/changing; inconvenient class timings; weather). A small number of respondents stated fear of injury as a barrier (1.4%) or did not want to be physically active at all (1.7%). Participants were given the opportunity to suggest further barriers to PA, in addition to those listed in the survey question; a range of responses were received which centred on not wanting to be active in the workplace, lack of time, health problems and facilities (table 5). Figure 2 illustrates that there was support for a range of incentives based on the provision of groups, classes and facilities. Suggestions for convenient exercise class times were provided by many; these were commonly immediately before or after working hours or short sessions at lunchtimes. Several other incentives for increasing PA were suggested by participants (table 5); these included cultural changes to the workplace such as addressing “the stigma of taking time out during the paid working day”, as well as practical suggestions such as cycle parking and marked routes to encourage active travel. Finally, in response to suggestions for other ways of enhancing employee well-being, a range of responses were obtained which fell into the following categories: (i) changing workplace culture, (ii) improving physical health, and (iii) improving mental health (table 6). The two most prominent themes were those of providing staff areas away from the desk/office to encourage socialisation and relaxation during lunch breaks, and reducing staff workload to enable them to take breaks for PA.

Qualitative Data

Thirteen staff (4 male, 9 female) participated in the focus groups. They included academic and professional staff from a range of age groups and PA levels. In relation to workplace well-being and the role of PA, all focus group participants agreed that workplace well-being was important, that PA was an essential component of general well-being, and that it had a role to play in workplace well-being. There was however common agreement that the term “physical activity” may be off-putting to some employees, due to the confusion over recommended PA dosage and what types of activity can contribute positively towards health and well-being. Participants in both focus groups saw PA as being important for mental as well as physical well-being, suggesting it was the only thing that “ticks all boxes”. Participants agreed that there should be the opportunity for PA to be part of the working day, even to be encouraged by line managers, for example:

“It’s not very common for your line managers to say, OK, you need to go for a walk for ten minutes and then come back...if you need to go away for half an hour or so to take a walk in the park...you’re going to be more productive [when you get back]”

[Participant 4 , Male, Support]

Much of the discussion in the focus groups provided more detail on the survey responses reported above, particularly the barriers and incentives to workplace PA and suggestions for enhancing well-being, including some practical suggestions relating to both these topics. Participants described a holistic view of well-being that included mental, physical and social dimensions, with workload-related issues being perceived as having the greatest impact on workplace well-being. In relation to barriers and incentives to PA and suggestions for enhancing well-being, we named the one overarching theme that arose from the remainder of the focus group data “The four C’s” as the issues discussed in both focus groups could be related to the following topics: (i) Change, (ii) Control, (iii) Communication, and (iv) Culture.

Change

Poor change management was perceived by several participants to negatively impact on workplace well-being. Issues relating to succession planning and leadership were thought by some to be contributing factors, for example:

“There’s issues with change and how you manage change and the uncertainty that comes from us seeing that there’s a change, you know, but not actually being involved...you know that you are going to have issues in four or five years time [with people retiring] but it’s after the person’s gone that you say “who is

going to teach that?...and suddenly you get a very chaotic time at work”

[Participant 2, Male, Academic]

At the time of conducting the focus groups, a planned campus move for some university staff was imminent, and several participants felt that uncertainty around the move was negatively impacting on their well-being, and that clearer communication on the implications of their move would have helped. Some participants admitted to a “fear of the unknown”, with one participant concerned that the change in working environment, where staff were perceived as less accessible to students, would result in the removal of “feeling of family”. Participants felt that such concerns were negatively impacting on their workplace well-being. It is possible that part of this theme was specific to the impending campus move, and it would be interesting to explore this theme further when staff have settled into their new location.

Control

Control was seen as impacting directly on well-being:

“The thing about work is that you may not have full control...I think that is really the overriding issue... [it] impacts on various aspects of your own well-being...whether it’s to do with working hours or meeting a deadline...the minute

you don't have control you can lose your sense of well-being"

[Participant 1, Female, Academic]

Control largely related to workload; a common theme throughout the survey responses and focus groups. Workload was discussed as directly affecting well-being and, due to time constraints, affecting people's ability to engage with workplace PA. Several participants discussed a lack of control over their workload and its impact on well-being, although there were differences between academic and support staff, with the support staff reporting a better understanding of their workload and closer supervision than their academic colleagues who were commonly unclear about what their workload should be:

"You're never really sure when you've done enough"

[Participant 8, Female, Academic]

"[it would help if] not necessarily reducing it [workload] but making it clear what exactly is my workload...what's an appropriate workload...what is actually expected of you"

[Participant 9, Female, Academic]

“All the team leaders have one-to-ones and work out what [staff] are working on, what they’re working to...it’s different in a non-academic department. I think we do have quite good workload structures”

[Participant 11, Female, Support]

This lack of clarity was a source of anxiety for some, and guilt was commonly discussed in relation to taking breaks, as staff felt there was an expectation to be at their desk all day:

“ I think this university does have a culture of working long hours...we have lectures over lunch breaks and other breaks and it’s the norm that we don’t take breaks...it we’re talking about well-being that’s something we maybe need to implement...make people take breaks”

[Participant 7, Male, Academic]

“I still feel guilty when I leave [for a legitimate break] the guilt’s still with me, you shouldn’t feel guilty but you do”

[Participant 10, Female, Academic]

Protecting breaks, particularly lunch breaks, by removing teaching and meetings was widely supported. Protected time for PA was suggested, along with “legitimising” the taking of breaks so that PA could be incorporated into the working day.

There was however agreement that no-one was currently being *forced* to be at their desk or to work long hours, and that there was an element of choice; however there was agreement that the culture did tend to encourage these activities:

“I am very well aware that it is choice [working long hours], that there’s nobody making me do that, that my work-life balance is completely skewed...you see other people doing it and it does become the norm”

[Participant 9, Female, Academic]

Conversely, some participants spoke of the need for the individual staff member to *take control* of their workload by assuming greater personal responsibility:

“I think it comes down to what individuals take on themselves...a professional choice...something’s wrong if people feel they have to work long hours”

[Participant 11, Female, Academic]

Those who held this, less common, view also believed that PA was a personal responsibility and that lack of motivation was likely to be the real reason behind low PA levels in those that cited workload issues and lack of time as barriers.

Communication

In addition to the campus move described above, communication was felt by many participants to be a key factor that contributed to workplace well-being, and was discussed in relation to feeling valued and included, as illustrated by one participant:

“...harmonious communication...smooth dialogue and debate and open communication...in addition to that an inclusivity, that everybody’s well-being is important and that no single person’s well-being is more important than another...so that everyone feels valued...and that their contribution...no matter how large or small is important overall. I think that is very important”

[Participant 6, Female, Academic]

Culture

Much of the discussion centred on the current culture within the university and the need for cultural change in order for PA levels and well-being to be enhanced.

Participants described the culture of failing to take breaks as being “entrenched” and

the need for management engagement and leading by example in order to reverse it. “Health champions” within schools and departments were seen as having a role to play in facilitating behaviour change. Focus group participants were provided with the list of common barriers to workplace PA from the survey (tables 4 & 5) and were asked to rank them. Highly ranked were inflexible working patterns and demanding workloads, which were seen to contribute to a lack of time for workplace PA, even in those who wanted to pursue it. Also highly ranked were environmental factors such as access to and cost of sports and recreational facilities (e.g. gym, walking routes), and also lack of motivation and energy, the latter being recognised as particularly challenging to address. Many of the suggestions for enhancing PA and well-being discussed in the focus groups have been described in the survey responses (tables 5 & 6). Additional ideas included prompted computer breaks, health promoting screensavers, alcohol information and counselling, access to occupational health services on campus, and providing plants in office spaces, as well as unanimous support for walking meetings.

Discussion

This study aimed to explore levels of PA and well-being in university employees, as well as barriers and incentives to workplace PA, in order to inform the development of appropriate and feasible PA and well-being interventions. Our main finding in relation

to PA was that according to the stage of change questionnaire 58% of participants met the recommended PA guidelines of 150 minutes per week;⁶⁻⁷ this rose to 77% according to the IPAQ. There are two possible reasons for this difference. Firstly, all participants completed the stage of change question; only 62% completed the IPAQ, which may be due to the relative simplicity of the former and complexity or length of the last-named questionnaire. It is therefore possible that participants who did not complete the IPAQ were those who did not meet the recommended PA guidelines. Secondly, it is possible that those who did complete the IPAQ over-reported their PA levels. This is a common finding with the IPAQ,^{40,42} and suggests that objective measurement of PA would be beneficial in this population, to gain a true representation of PA levels. Despite this discrepancy, the number of participants meeting the recommended PA guidelines, measured by either tool, is not dissimilar to recent population findings of 62%,⁸ and to some previous research on university staff using the IPAQ.²⁷ It is however considerably different to the 42% reported in a recent study on active travel in an Australian University.²⁶ However, the majority of their sample was students, which may account for the differences; work currently underway by our research team exploring PA and well-being in university students will confirm or refute this theory.

Our finding that males were more active than females is in keeping with findings from population studies,⁶ and suggests that PA interventions specifically targeting female university staff may be indicated.

Our finding that support staff were more active than academic staff is interesting, as it is in contrast to previous research.²⁷ This may be due to cultural or employment differences, as Agha & Al-Dabbagh²⁷ surveyed not only university, but staff from primary and secondary schools. It is possible that in our sample, the support staff who responded were those employed in active roles where they would meet the PA guidelines during their working day. Conversely, it is possible that they had sedentary positions and actively sought to be physically active to counteract this. Or, it is possible that our support staff experienced fewer barriers to PA than academic staff, as academic staff workload was cited as a common barrier in the focus groups. However, it should be noted that the difference in PA between academic and support staff was not statistically significant.

Our main finding in relation to well-being was that there was a relationship between PA and well-being scores, with lower PA associated with lower well-being. This is in keeping with previous research,³ and strengthens the argument for workplace PA interventions, due to the potential effect not only on physical, but on mental well-

being. It can be seen (table 3) that the WEMWBS scores for those with low PA in our sample are below the population means for males, females and the sample as a whole. It should be noted that there is no cut-off point for the WEMWBS that defines poor mental health,⁴¹ but it is notable that WEMWBS scores are typically around 51 for a range of populations,⁸⁻⁹ and our scores for those with low PA levels are considerably below that. Of course, this relationship does not indicate that low PA causes lower mental well-being scores, but it is nonetheless an interesting finding. Given the reported prevalence of mental health issues in university staff,³⁴⁻³⁵ our findings indicate that enhancing mental well-being within our population should be a priority, and it will be interesting to measure well-being in this sample after the implementation of PA and/or workplace wellness interventions.

Our finding that lack of time and expense of facilities were common barriers to PA is in keeping with previous research in other populations⁴³ and university employees.²² The recurring theme from the questionnaire and focus groups of the university culture not being conducive to promoting PA resonates with George et al's study on Australian male university employees²²¹ As in our focus groups, they too discussed the need for cultural change within the university setting and for PA to be seen as a "legitimate activity". Their participants endorsed a "top-down" approach, consistent with our participants' desire for PA "champions". Some of the suggestions proposed by our

participants for enhancing both PA and well-being would appear to be feasible (e.g. taking breaks, promoting active travel), and are being actively pursued by our healthy university committee. The issue of workload highlighted by this and other studies,²² whether real or perceived, is perhaps more challenging to address, but given the reported well-being levels in this study and reported mental health issues in others³⁴⁻³⁵ it is one that should not be ignored.

The overwhelming support by our participants for walking meetings is encouraging, given the work to date on walking interventions in university settings,^{20, 22, 28-}²⁹ suggesting that such interventions, which can be relatively low-cost, may be worth replicating in our setting.

The strength of our study is the exploration of both PA and well-being. There are however some limitations. The response rate to the electronic questionnaire was relatively low. However, response rates to electronic questionnaires are typically lower than other questionnaire methods⁴⁴ and our response rate was similar to other surveys in university populations.²³ In order to reassure participants of anonymity we only collected employment-related information on status (full/part time; academic/support) and faculty in which they were based, and were therefore not able to identify any trends in responses by particular subgroups of HEI staff; this may be

worthy of further study. Our focus group participants were self-selected; this is of course unavoidable in ethical research, but it is possible that they represented a particular subgroup in respect of their beliefs about PA and well-being. This could only be addressed by a larger, qualitative study that actively seeks alternative viewpoints, and may be worth considering in order to fully explore this important topic.

Conclusions

This study has described PA, well-being, and the relationship between the two in a sample of UK university employees. It has demonstrated that up to 42% of these employees do not currently meet the recommended PA guidelines of 150 minutes per week, that females are less active than males, and that academic staff may be less active than support staff. This study has also demonstrated that lower PA levels are related to lower well-being scores in this sample, that there are a number of barriers to workplace PA, and that some could be relatively easily addressed whilst others, such as workload, may require a more complex solution. This study has directly led to strategies aimed at enhancing PA and well-being in university staff, led by the healthy university committee, which recognises the importance of staff as well as student well-being. Work is also being undertaken to encourage staff to get away from their desks and take a break through a variety of activities not solely focused on PA such as 'knit

and natter', mindfulness, and 'get crafty', with further research planned to determine the effectiveness of these strategies on PA and well-being.

Acknowledgements

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Conflicts of Interest

None

Table 1: Study participants and population demographics

	Study sample (n=502)	HEI population (n=1479)
Gender	71% Female	59% Female
Position	39% Academic	46% Academic
Employment	79% Full-time	Data not available
Age: 18-24	5.6%	6.7%
25-30	11%	8.9%
31-40	22.3%	23.2%
41-50	29%	28%
51-60	28.3%	26.8%
60+	3.8%	6.4%

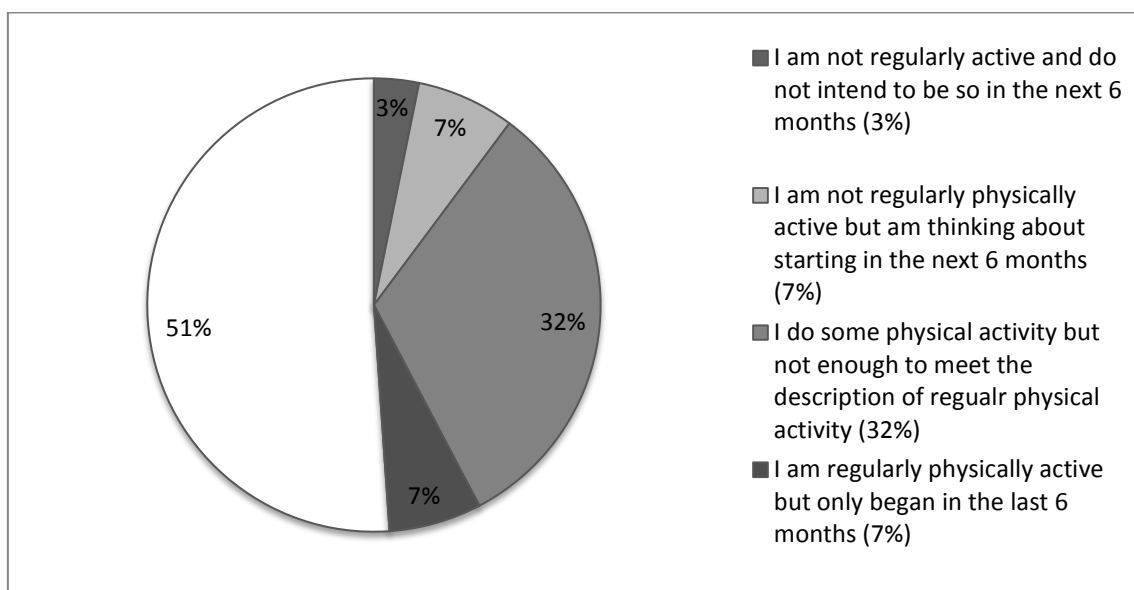
Table 2: Physical activity by gender & employment type

Physical Activity	Male	Female	Academic	Support
Low	13.1% *	27.8% *	20.9%	24.5%
Moderate	39.4%	38.9%	46.8%	33.9%
High	47.5% *	33.3% *	32.3%	41.6%

* Statistically significant difference between genders

Table 3: Mental Wellbeing scores for low, moderate & high physical activity groups

Gender	IPAQ Low	IPAQ Moderate	IPAQ High	Scottish Health Survey (2012)
Male	47.9 (7.1)	49.4 (8.9)	50.2 (8.2)	50.4
Female	45.5 (9.5)	48.8 (9.6)	50.7 (8.5)	49.4
Sample	46.0 (9.1)	49.0 (9.4)	50.6 (8.4)	49.9

**Figure 1: Participants' self-reported stage of change for physical activity (%)**

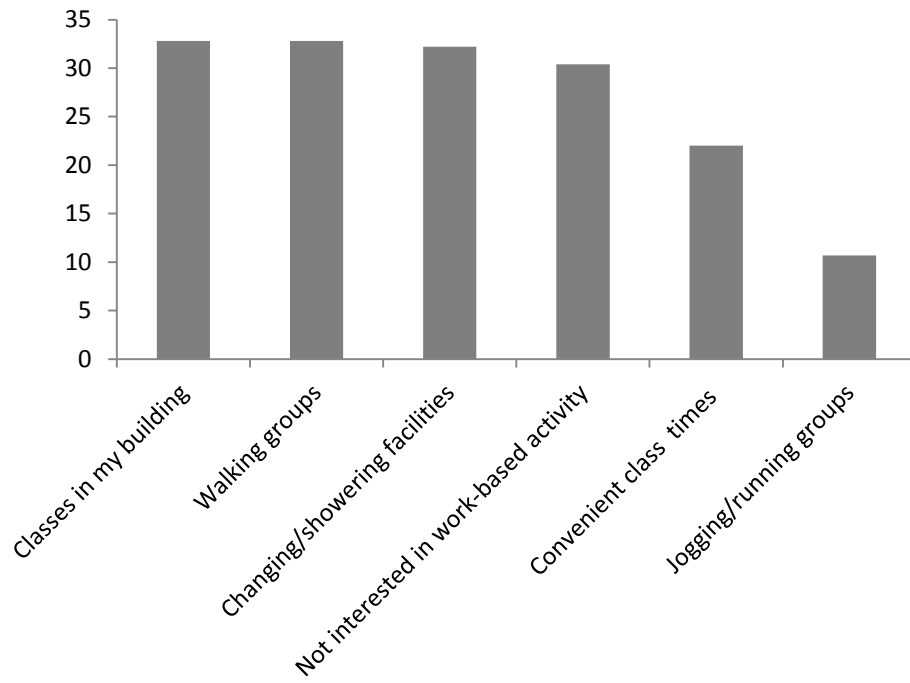


Figure 2: Incentives to work-place physical activity (% respondents per item)

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