Physical activity of physiotherapists in Germany: a cross-sectional study

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Abstract

Aim We aimed to quantify the work-related physical activity of physiotherapists in Germany.

Subjects and methods We included working physiotherapists aged between 18 and 65 years in Germany. We excluded physiotherapists working less than 20 h a week. We measured our primary outcome, work-related physical activity, by the average number of steps taken daily during work, standardized on an 8-h working day. We controlled the main outcome for potential confounders, such as working hours per week, age, weekday, and clinical setting (outpatient vs. inpatient), by multivariate linear regression analysis. We used R statistics for all statistical analyses.

Results We included 35 participants (7 outpatient and 28 inpatient), with a median age category of 20–29 years. Our participants had a mean work-related physical activity of 6614 steps (95% confidence interval, CI [6118; 7111]) per workday. Higher age, outpatient clinical setting, and working full time were associated with lower step count, but these associations were not statistically significant.

Conclusions The work-related physical activity of physiotherapists in Germany is comparable with results from other countries and can be regarded as ‘low’. Our result, however, might be affected by volunteer bias and gender effects. Further research should identify high-risk groups in the profession for cost-effective prevention.

Keywords Physiotherapy · Physical activity · Occupational health · Cross-sectional study

Introduction

Physical inactivity is one of the major risk factors for developing chronic, non-communicable diseases (Guthold et al. 2018; Martin et al. 2006). This risk factor can easily be avoided by physical activity (Ekelund et al. 2016; Rütten and Pfeifer 2016). In Germany, every second employee states to work in the majority of the time in a sitting or standing position (Finger et al. 2017). In the literature, work-related

physical activity is regarded as health promoting (Abu-Omar and Rutten 2008; Samitz et al. 2011; Sofi et al. 2007), although not to the same extent as leisure-time-related physical activity (Sofi et al. 2007). Despite this, an overall increase of work-related physical activity seems to be a suitable approach in order to prevent non-communicable chronic diseases (Goldgruber and Ahrens 2010; Wilke et al. 2012).

An essential approach for achieving higher amounts of work-related physical activity is a workplace-related approach, which should consist of: (1) a concrete supply of preventive measures, (2) the redesign of work-related processes, and (3) the creation of activity-promoting infrastructure at work (Rütten and Pfeifer 2016).

The creation of activity-promoting infrastructure at work can also be beneficial for medical personnel; for example, it was shown that cardiologists only walked between 5000 and 6000 steps per working day (Abd et al. 2012), instead of the recommended amount of 10,000 to 12,000 steps per day (Rütten and Pfeifer 2016). In the German healthcare system, there are approximately 197,000 physiotherapists (Statistisches Bundesamt 2019). According to the World Confederation of Physical Therapy (WCPT), physiotherapists

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explicitly cover the areas prevention and health promotion and, amongst others, it is their core responsibility to motivate people to participate in physical activity (WCPT 2017). However, until now, it is unclear how active physiotherapists in Germany are and if there is actually a need for primary prevention in the physiotherapy profession.

The primary aim of our study was to quantify the work-related physical activity in physiotherapists in Germany.

Materials and methods

This explorative study was a cross-sectional study and was conducted in January 2018. It involved a convenience sample among physiotherapists in Berlin and Gera. Inclusion criteria were: (1) working clinically in an outpatient or inpatient setting and (2) working more than 20 h per week. Exclusion criteria was working less than 20 h per week.

Our primary outcome was the mean number of steps walked per workday (continuous). We recorded the data on five consecutive days with a pedometer (Omron Walking Style IV, Omron, Kyoto, Japan), standardized on an 8-h working day. We choose pedometers because these are valid assessments to estimate physical activity and the measurement on five consecutive days is reliable (Kang et al. 2009a; Tudor-Locke et al. 2002).

Our primary outcome, work-related physical activity, was analyzed by a multivariate linear regression model, controlled for working hours per week, age, weekday, and setting (outpatient vs. inpatient) (Bolker et al. 2009). The predictive performance of the model was estimated by cross validation ($k = 2$) and R^2 . In case of multicollinearity, the corresponding variable was excluded from analysis (James et al. 2013). All statistical analyses have been conducted with the software R statistics (R Core Team 2012). The level of significance α was set to 0.05.

Results

Overall, 35 physiotherapists participated in the study. Their characteristics can be found in Table 1.

Primary outcome

The mean number of steps walked during an 8-h working day was 6614 (95% confidence interval, CI [6118; 7111]). A boxplot of the distribution of the number of steps walked over the age of the participants can be found in Fig. 1.

The number of steps walked during an 8-h working day depending on the setting (outpatient vs. inpatient) can be found in Fig. 2. The number of steps (mean (standard deviation, SD)) walked in an outpatient setting was 6393 (2195)

Table 1 Characteristics of the participants

	No. (%)
Age (years)	
17–19	1 (3)
20–29	20 (57)
30–39	9 (26)
40–49	4 (11)
50–59	1 (3)
60–67	0
Setting	
Outpatient	7 (20)
Inpatient	28 (80)
Working time	
Full-time (40 h/week)	29 (83)
Part-time (<40 h/week)	6 (17)

and in an inpatient setting, it was 6670 (1242). There was no statistically significant difference between the two settings (mean difference, MD = 277 steps; $t = -0.32044$, $p = 0.76$, 95% CI [−2316; 1763].

The number of steps walked per 8-h working day (mean (SD)) varied slightly between weekdays: Monday 6157 (1697), Tuesday 5827 (1768), Wednesday 6570 (1971), Thursday 6364 (1665), and for Friday 5801 (1771). A boxplot over the distributions can be found in Fig. 3.

The analysis of the dependent variable (number of steps walked during an 8-h working day) by multivariate linear regression ($n = 34$) with the prediction variables age, working time (hours per week), and professional setting (outpatient vs. inpatient) yielded no statistically significant difference (adjusted R^2 in the test data = 0.09; Table 2). The independent variable weekday was removed from the model due to multicollinearity.

Fig. 1 Number of steps walked during a standardized 8-h working day by age category ($n = 35$)

Fig. 2 Number of steps walked during a standardized 8-h working day by clinical setting ($n = 35$)

Discussion

Our results suggest that physiotherapists in Germany walk about (mean (SD)) 6500 (1600) steps on a representative 8-h working day. Although the differences were not statistically significant, the number of steps walked seems to be decreased with higher age and increased in physiotherapists working in an inpatient clinic compared to an outpatient setting.

The results of this study are in line with Abd et al. (2012), who showed that cardiologists and cardiac surgeons achieved a similar level of physical activity of 5000 to 6000 steps per day (Abd et al. 2012). According to the pedometer index of Tudor-Locke and Bassett (2004), the work-related physical activity of physiotherapists in Germany should be classified as ‘low active’ (Tudor-Locke and Bassett 2004). In a multicenter cross-sectional survey, which measured work-related physical activity among American physiotherapists by accelerometers, there were

Fig. 3 Number of steps walked during a standardized 8-h working day by weekday ($n = 35$)

Table 2 Analysis of the predictors age, clinical setting, and working time on the primary outcome, work-related physical activity (numbers of steps walked during an 8-h working day). Multivariate linear model with cross-validation applied on the test data ($n = 34$). Adjusted $R^2 = 0.09$

	β coefficient	Standard error	t -Value	p -Value
(Intercept)	9926.6	1775	5.592	<0.0001
Age	−120.06	521.23	−0.230	0.82
Setting	107.28	783.89	0.137	0.89
Working time	−81.82	40.11	−2.040	0.06

similar results in this regard (Brewer et al. 2016). However, the recommended optimum of physical activity by guidelines was not achieved: the mean (SD) number of steps walked during work in an outpatient setting was 3195 (1333) steps and in inpatient setting, it was 4475 (1465) (Brewer et al. 2016). Our results showed that physiotherapists in Germany walk more steps during work than their colleagues in the United States and that working in an inpatient setting was associated with a higher level of physical activity. The latter could be explained by different work organization procedures in inpatient settings (e.g., working on a single hospital ward vs. working among different wards), which could have resulted in longer distances to be walked in order to see a patient. There are also indications that longer working time was associated with a lower step count. This could be explained by a possibly higher compression of work in the schedule of part-time workers, thus resulting in a higher relative physical activity.

The results show that physiotherapists in Germany are suitable candidates for individualized health promotion programs by promoting physical activity (Ziesche and Köppel 2017), which should: (1) be implemented after assessing the employees’ demands, (2) be close to the workplace, (3) have a responsible key person, and (4) have a marketing platform (Wollesen et al. 2017).

A limitation of this cross-sectional study is that volunteer bias may have occurred and rather physically active therapists voluntarily participated in the study, which may overestimate the real amount of work-related physical activity in physiotherapists in Germany. Essential covariates like the age of the participants, clinical setting, and weekday have been controlled and taken into account in the analysis. It should also be taken into account that only the surveillance of physical activity with pedometers can raise the physical activity by up to 2000 steps per day, which may also result in an overestimation of physical activity (Kang et al. 2009b).

One could also argue that the analysis did not control for gender effects. In the published literature, it was shown that women in general have a lower mean work-related physical activity than men (Finger et al. 2017). Since this might rather be a self-selection effect between different professions, we discarded this analysis.

Another limitation is the small sample size of this study, so future studies should recruit more participants, control for gender-specific effects, and include other professional settings

of physiotherapists (like working in schools/universities), as well as physiotherapists working over weekends.

Conclusion

The work-related physical activity of physiotherapists in Germany can be regarded as ‘low active’ and is comparable to those of physiotherapists and other medical professions in other industrialized countries.

Contributions of authors Conceptualization: Author 2, Author 3, Author 4, Author 1; Methodology: Author 1; Formal analysis and investigation: Author 1; Writing - original draft preparation: Author 1; Writing - review and editing: Author 6, Author 5; Funding acquisition: Author 1, Author 2, Author 3, Author 4; Supervision: Author 5, Author 6.

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Compliance with ethical standards

Informed consent was obtained from all individual participants included in the study. The approval of the local ethics committee was given (1422-0515). All testing was ethically harmless and the measures used are internationally certified and are standard outcome measures for physical activity. The evaluation was carried out in accordance with the 2013 Helsinki Declaration.

Conflict of interest The authors declare that they have no conflict of interest.

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