PHYSICAL ACTIVITY, DAILY LIFE ACTIVITIES AND MOOD OF PATIENTS WITH SCHIZOPHRENIA SPECTRUM DISORDERS: RESULTS OF THE DiAPASon STUDY

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INTRODUCTION

Patients with Schizophrenia Spectrum Disorders (SSDs) often show marked impairments in daily time functioning, with adverse consequences for prognosis, number of medical comorbidities and mortality rates. The integration of innovative methodologies (e.g., Ecological Momentary Assessment, EMA) and wearable devices like accelerometer-based biosensors in research and clinical practice with individuals with SSD is promising because these tools may reduce biases, provide longitudinal, objective and time-resolved ecologically valid data, and capture the variability over time and their dynamic patterns of reactivity to the environment.

AIMS

We aimed at investigating potential differences in physical activity (PA) levels, daily life activities, and mood in individuals with SSD (outpatients and residential patients) compared with healthy controls by means of a 7-days ecological monitoring with both a wearable sensor (for PA monitoring) and a mobile-based EMA questionnaire (for daily activities and mood).

MATERIALS AND METHODS

The DiAPASon (DAily time use, Physical Activity, quality of care and interpersonal relationships in patients with SSDs) Italian multicentre study [1], funded by the Italian Ministry of Health, took place in 37 Departments of Mental Health (DMHs) and residential facilities (RFs) across the country. Recruitment started in October 2020 and ended in October 2021. The project was coordinated by the IRCCS Fatebenefratelli of Brescia, the DMH of Modena and the DMH of Pavia.
Inclusion criteria for all study participants were: a clinical diagnosis of SSD, age 18-56 years and a good knowledge of the Italian language. All patients were in treatment at residential facilities or as outpatients at DMHs. Healthy controls were matched for age and sex with SSD patients.
PA levels were monitored through the wearable accelerometer-based biosensor Actigraph GT9X Link, which is a validated triaxial accelerometer manufactured by ActiGraph, LLC. The Actigraph was worn on the non-dominant wrist for 7 consecutive days, which were the same days for the EMA monitoring, which included three sections: current activities, social contacts, and mood. Smartphone notifications occurred 8 times a day, from 8 a.m. to 12 p.m.
Individual GT3X files were processed using the GGIR R package [2] in order to estimate the Euclidean Norm minus One (ENMO) using 60 seconds epoch and defaults settings, the VO2 and the Metabolic Equivalent of Tasks (METs) to define PA levels (sedentary, light, moderate, vigorous).
Time spent within different PA levels was described as daily average and modelled across residential patients, outpatients and control participants both considering minutes spent in each level as outcomes, using a Generalized Linear Mixed Model (GLMM) assuming a negative binomial distribution for the response variable and a random intercept (patient), and multinomial logistic model focusing on daily percent time

usage in different activities. Data on daily time use were synthetized in terms of daily average number of times each activity was done and compared across the three groups through a Poisson generalized estimating equations (GEE) model. Results were reported in terms of rate ratios (RRs) with their 95% confidence intervals (CIs).

RESULTS

A total of 53 residential patients, 46 outpatients, and 111 healthy controls who replied at least 70% of the EMA notifications and who wore the biosensor for at least 10 hours for 4 valid days were included.
SSD patients and healthy controls differed for all activity levels (both min/day and %) (Figure 1), with healthy controls showing higher PA levels than the two patient groups. Sedentary time (in minutes) was significantly higher in residential patients compared to both outpatients and controls (respectively RR 1.13 [95% CI: 1.06-1.20]; p<.001); RR 1.15 [95% CI: 1.10-1.21]; p<.001). Outpatients and controls did not differ for the amount of time spent in sedentary PA level (RR 1.02 [95% CI: 0.97-1.07]; p=.47). When expressed in relative terms, sedentary time represented 49.4-53.3% of total wake time in patient groups, which was also a significantly larger fraction compared to healthy controls (i.e., 39.6%).

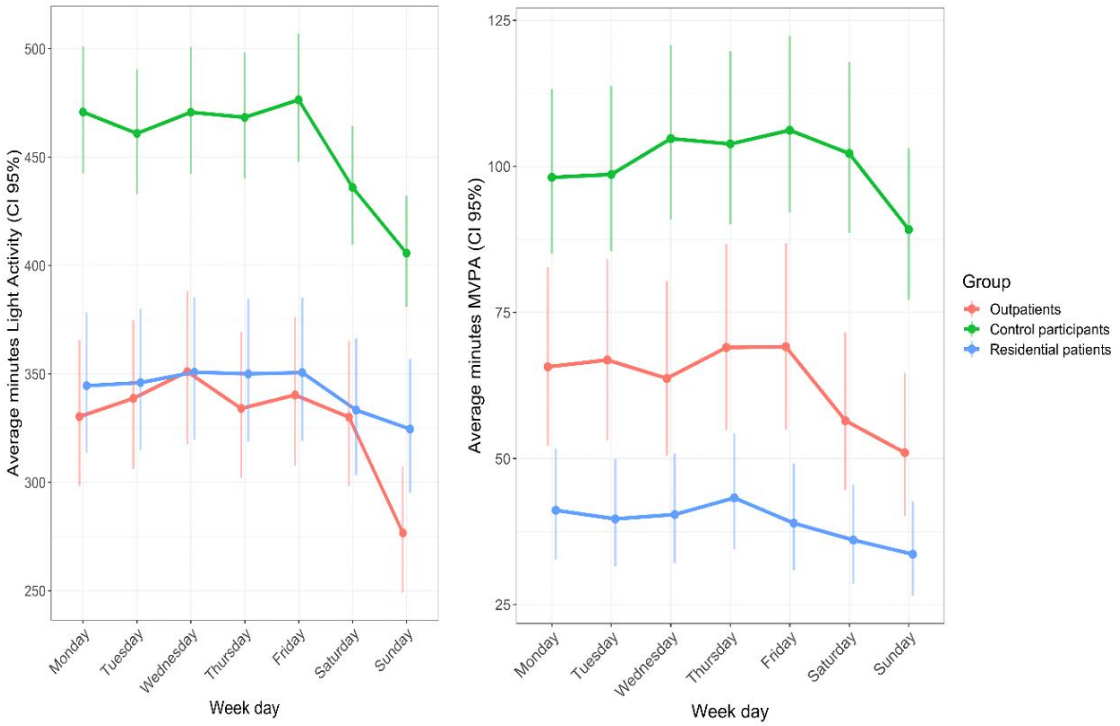

Figure 1. Light physical activity (a) and moderate to vigorous physical activity (MVPA) (b) pattern in the DiAPASon study

Healthy controls showed significantly higher levels of MVPA, compared to both outpatients and residential patients. Outpatients spent a significantly larger fraction of time doing MVPA compared to residential patients (RR 0.61 [95% CI: 0.46-0.81]; p<.001 for daily mean min/day. RR -3.74% [95% CI: -5.806%- -1.664%]; p=<.001 for daily %).

Residential patients were significantly less engaged in productive activities when compared to both outpatients (RR 0.52 [95% CI: 0.37-0.73]; p<.001) and healthy controls (RR 0.22 [95% CI: 0.17-0.30]; p<.001). In addition, healthy controls were significantly more engaged in non-productive activities when compared to both outpatients (RR 2.88 [95% CI: 2.14-3.89]; p<.001) and residential patients (RR 2.29 [95% CI: 1.67-3.15]; p<.001). Finally, residential patients spent more time in self-care activities than healthy controls (RR 1.38 [95% CI: 1.11-1.71]; p=.0014).
No differences in average ratings of positive mood emerged, while residential patients showed a higher negative mood intensity when compared to both outpatients (mean difference 6.1 points [95% CI: 0.1-12.1]; p=.04) and healthy controls (mean difference 7.4 points [95% CI: 2.4-12.3]; p=.0015). Outpatients and healthy controls did not differ in terms of negative mood intensity.

CONCLUSIONS

Sedentary behaviour, daily life activities and mood should be monitored among individuals with SSD and be the target of specific ad hoc interventions aimed at improving the recovery of such patients.

REFERENCES

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