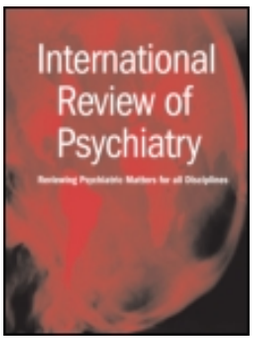

International Review of Psychiatry

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/iirp20

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To cite this article: Gaia Sampogna, Marta Borgi, Barbara Collacchi, Francesca Cirulli, Stefania Cerino, Santo Rullo, Matteo Di Vincenzo, Mario Luciano, Valerio Di Tommaso, Stefano Moliterni, Alberto Bichi, Jonathan Garside, Sampsa Kivistö, Alin Iarion & Andrea Fiorillo (2022): Using sport-based interventions for people with severe mental disorders: results from the European EASMH study, International Review of Psychiatry, DOI: 10.1080/09540261.2022.2106122

To link to this article: https://doi.org/10.1080/09540261.2022.2106122

Published online: 02 Aug 2022.

INTERNATIONAL REVIEW OF PSYCHIATRY
https://doi.org/10.1080/09540261.2022.2106122

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ARTICLE

Using sport-based interventions for people with severe mental disorders: results from the European EASMH study

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ABSTRACT

People with severe mental disorders report significantly poorer physical health and a higher mortality rate compared with the general population. Several interventions have been proposed in order to challenge this mortality gap, the promotion of physical activities represents one of the most important strategies. In fact, in people with severe mental disorders, physical activity can improve body composition, quality of life, personal functioning, self-esteem, cognition, and cardiorespiratory fitness, as well as reducing affective, psychotic and anxiety symptoms, cardiometabolic burden and increase the global recovery. While sport-based programs are consistently being proposed as an integral part of effective personalized treatment approaches for people with severe mental disorders, their routine implementation is hampered by poor working task integration among different professionals and the lack of training programmes for sport professionals focused on people with severe mental disorders. In this paper, we will: (a) review the efficacy of exercise/sport-based interventions for people with severe mental disorders; (b) describe the main difficulties in engaging patients with severe mental disorders in these interventions; and (c) report the results of the first study on the best practices available in Europe in the field of sport and mental health carried out in the context of the European Alliance for Sport and Mental Health (EASMH) project. According to the EASMH survey, sport-based psychosocial interventions are not frequently available in mental health services, with significant differences at the European level. In the near future, it would be advisable to promote the integration and collaboration between mental health professionals and sport professionals, in order to improve the dissemination and availability of sport-based interventions in routine clinical practice. The EASMH project aims to fill this gap by creating a network of collaborators, researchers and stakeholders with different backgrounds in order to improve the dissemination of sport-based rehabilitation interventions and by developing an innovative training programme for sport coaches in order to improve their skills in interacting and building an effective relationship with people with severe mental disorders.

ARTICLE HISTORY
Received 7 July 2022
Accepted 22 July 2022

KEYWORDS
Physical activity; mortality gap; rehabilitation; social inclusion

Background

People with severe mental disorders report significantly poorer physical health and a higher mortality rate compared with the general population (Liu et al., 2017; Oude Voshaar et al., 2021; Filipčić et al., 2018). The issue of premature mortality in patients with severe mental disorders is considered a priority for healthcare professionals by the World Health Organisation (WHO) (Fiorillo & Sartorius, 2021; Thornicroft, 2011; Chew-Graham et al., 2021). Among those factors contributing to mortality gap (Leucht et al., 2007), the frequent adoption of unhealthy lifestyle behaviours plays a significant role in determining the higher rate of physical comorbidities – such as coronary heart disease, diabetes, respiratory – and infectious diseases, in people with severe mental disorders (Ayerbe et al., 2018; Buhagiar et al., 2020; De Leon et al., 2020; Maj et al., 2020; 2021; Nielsen et al., 2021; Stubbs et al., 2018). In particular, people with severe mental disorders tend to be sedentary, are heavy smokers (Chesney et al., 2021; Estrada et al., 2016; Kim et al., 2021; Ringin et al., 2021; Zangen et al., 2021), frequently use alcohol

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(Drake et al., 2020; Listabarth et al., 2020; Squeglia, 2020) or other illicit drugs (Sánchez-Gutiérrez et al., 2020; Volkow et al., 2020), have an unbalanced diet and practice low levels of physical activity (Vancampfort et al., 2017; Sampogna et al., 2021).

Physical activity is defined as 'any bodily movement produced by skeletal muscles that results in energy expenditure,' while physical exercise is defined as 'a subset of physical activity that is planned, structured, and repetitive and has as a final or an intermediate objective the improvement or maintenance of physical fitness' (Caspersen et al., 1985). Physical activity and physical exercise have preventive and therapeutic effects on physical and mental health (Ekelund et al., 2016). In particular, physical activity is associated with a reduced risk of all-cause and cardiovascular mortality as shown by large cross-sectional studies (Chekroud et al., 2018). A large number of reviews indicates that there is an abundance of research demonstrating that physical activity and physical exercise positively influences the brain and cognitive functioning (Stillman & Erickson, 2018).

Furthermore, in people with severe mental disorders, physical activity can improve body composition, quality of life, personal functioning, self-esteem, cognition, and cardiorespiratory fitness (Kandola et al., 2019), as well as reducing affective, psychotic and anxiety symptoms (Angevaren et al. 2008; Smith et al. 2011) and cardiometabolic burden (Correll et al., 2020; Fabrazzo et al., 2015; Firth et al., 2020; Pereira et al., 2019; Plana-Ripoll et al., 2020; Stubbs et al., 2018; Taipale et al., 2020). Improving physical activity could act indirectly, increasing patients' social connectedness, which represents an essential component of the recovery process in patients with severe mental disorders (Brooke et al., 2019; De Rosa et al., 2017; 2018; Luciano et al., 2021a; 2021b; Sampogna et al., 2018; Kirschner et al., 2022).

Sport and physical activities may not only prevent physical health problems but can also be effective in improving mental health. Indeed, sport-based programs are consistently being proposed as an integral part of effective personalized treatment approaches for people with severe mental disorders (Zschucke et al., 2013). However, the routine implementation of these programs in mental health care is hampered by several factors, including poor working task integration among different professionals (i.e. psychiatrists, psychologists, rehabilitation technicians and sport coaches) and the lack of training programmes for sport professionals on how to engage people with severe mental disorders in sport-based interventions (Robson et al., 2013). It is important to promote these interventions and the connected methodologies as they may afford a greater life quality and physical health in people affected by severe mental health disorders (Fava & Guidi, 2020; Feldman, 2020; O'Donoghue, 2021).

In this paper, we will: (a) review the efficacy of exercise/sport-based interventions for people with severe mental disorders; (b) describe the main difficulties in engaging patients with severe mental disorders in these interventions; and (c) report the results of the first study on the best practices available in Europe in the field of sport and mental health carried out in the context of the European Alliance for Sport and Mental Health (EASMH) project.

Efficacy of exercise/sport-based interventions in people with severe mental disorders

Several recent meta-analyses have shown that physical activity, particularly structured physical exercise, can significantly improve psychotic positive and negative symptoms, cognitive functions (such as working memory, attention, and alertness) and social functioning in people with severe mental disorders (Zschucke et al., 2013). Patients with mental disorders who regularly perform physical exercise have a better quality of life compared to those inactive patients (Brooke et al., 2019). Furthermore, by increasing cardiorespiratory fitness and metabolic health, physical exercise may also reduce the incidence of physical health diseases, such as obesity and diabetes, which are particularly frequent in people with severe mental disorders, contributing to the reduced life expectancy in these people (Firth et al., 2016; Kandola et al., 2019).

There is data to support the effectiveness of physical activity interventions on executive function among people with neurodevelopmental disorders (Sung et al., 2022; Borgi et al., 2016). Moreover, physical exercise increases hippocampal volume and white matter integrity in healthy older adults and also in people with schizophrenia (van der Stouwe et al., 2018). Additionally, cross-sectional research in people with schizophrenia has demonstrated that physical activity and fitness are associated with better cognitive performance, greater grey and white matter volumes, and higher levels of neurotrophic factors which promote brain plasticity (Zschucke et al., 2013).

In patients with unipolar depression, physical exercise has a moderate to large effect in improving global functioning compared to control conditions. Analysis of exercise as an add-on to antidepressant medication

indicated a moderate effect in favour of the combination treatment (Kandola et al., 2020). For people with depression, consistent evidence shows that aerobic exercise is effective compared to control conditions at follow-up in reducing depressive symptoms. Moreover, physical exercise improves cardiorespiratory fitness compared to control conditions and improves the overall quality of life.

The data on resistance training – defined as the use of resistance to muscular contraction to build the strength, anaerobic endurance and size of skeletal muscles – as a standalone intervention for depression are limited; only two studies have evaluated the efficacy of resistance training in people with depression, showing a positive impact of these interventions on the global level of depressive symptoms and quality of life (Krogh et al., 2009); Kvam et al., 2016).

Among the various types of exercises, team sports such as football and basketball (which requires social interaction, visual cognition and executive functioning), and individual exercise (such as running and dribbling) may be particularly indicated for people with cognitive deficits, which represents a transdiagnostic feature for many severe mental disorders (Menon, 2020). In fact, interpersonal coordination, i.e., adjusting an individual's movements while reading others' intentions and predicting their movements, is related to improved social cognition (e.g., biological motion perception) (Moritz, 2020). The positive effects of football-based interventions (e.g. self-reported quality of life mainly through interviews as a longitudinal study), have been reported especially in patients with schizophrenia (Battaglia et al., 2013; Fujii et al., 2020).

Incentives and barriers in accessing exercise/sport-based interventions

The primary incentive for engaging in exercise is represented by the improvement of physical health (Eime et al., 2018). Specifically, weight loss was the single most popular reason for participating in exercise for people with severe mental disorders, a finding in line with those coming from the general population. Although weight management can be a key motivating factor for initiating exercise programmes, it is important to note that physical activity has a relatively modest contribution to weight loss, beyond that achieved through dietary interventions (Cox, 2017). Moreover, improvements in mental and physical health outcomes following exercise interventions are often achieved independently of weight loss (Slade & Sweeney, 2020; Stanton et al., 2015). While weight management represents an important motivating factor for people with severe mental disorders to start exercise programmes, education and support should be provided in order to guarantee that these programmes are maintained over a long-term regardless of any body weight change.

Therefore, health promotion programmes should emphasize the benefit of fitness in order to maximize the effects of exercise in patients with severe mental disorders.

About 75% of patients with severe mental illness consider the importance of psychological effects of physical exercise, in particular on stress reduction, mood enhancement, psychological well-being and depressive symptoms (Schuch & Vancampfort, 2021).

Despite all the benefits of physical activity for people with severe mental disorders, many barriers lead to lack of motivation and self-efficacy. For instance, while professionals and family members report the lack of social support as a barrier to practise physical activity, patients often report that physical activity is not considered a priority compared to other mental health treatments (Schuch & Vancampfort, 2021).

Barriers limiting the possibility for people with severe mental disorders to engage in physical activities include medications' side effects (Correll et al., 2020; Fabrazzo et al., 2015; Plana-Ripoll et al., 2020), complications due to obesity/poor physical health (Shor & Shalev, 2016), lack of resources/professional support (Firth et al., 2016), and poor motivation (Mishu, 2019). Indeed, it has been shown that motivational coaching can augment the effects of exercise interventions, increasing physical activity participation (Suen et al., 2021). Other barriers are represented by stress, depression and low energy (Firth et al, 2016). In people with schizophrenia, the most frequently reported practical barrier was 'lack of support' (Kandola et al., 2020; Klingaman et al. 2014). This difficulty was also reported by people with first-episode psychosis, who also highlighted the role of 'lack of training partner'.

It may be useful to identify the clinical and social variables associated with the probability to perform any type of physical activity in patients with severe mental disorders, in order to develop tailored interventions (De Rosa et al., 2017; Romain et al., 2020). It is essential to increase the awareness of patients and their carers on the fact that improving the levels of physical activity can be associated with a significant reduction in mental health morbidity, physical comorbidity and mortality rates (Fiorillo et al., 2019).

Sport-based interventions and mental health: findings from the EASMH project

It has been claimed that research priorities in mental health should shift from efficacy studies to pragmatic effectiveness trials (Fiorillo et al., 2019). Specifically, there is the need to develop replicable and scalable methods for delivering physical activity interventions to people with severe mental disorders, in a format that is accessible, engaging, and effective for a large number of patients. It is indeed of utmost importance delivering training programmes for mental health staff (e.g. psychologists, psychiatric nurses, psychiatric rehabilitation technicians, etc.) in order to improve their knowledge of the benefits of physical activity and support them in the implementation of exercise interventions for people with severe mental disorders. However, there is sufficient evidence to indicate that the most effective and engaging interventions will be those that are delivered by qualified exercise professionals (rather than mental health staff) and delivered at sufficient levels of intensity to significantly improve physical capacities, such as cardiorespiratory fitness.

Based on these premises, the European Commission, under the Erasmus + actions, has funded the European Alliance for Sport and Mental Health (EASMH) project. The EASMH project aims to identify the best practices available in Europe in the field of sport and mental health. As part of the activities of the project, an online survey has been disseminated with a focus on the availability of sport-based interventions in the different EU countries participating in the research consortium (Italy, Finland, United Kingdom and Romania).

In each participating country of the EASMH network, at least 30% of mental health departments have been randomly selected and invited to participate in the study. Furthermore, in Finland and Romania, main public and private mental health services (foundations, charities) already providing and/or interested in delivering physical activity rehabilitation interventions were invited to participate, as well as Finnish Regions' Health Care Districts, the Finnish Central Association for Mental Health, the local Health Care Districts, and the Finnish Paralympic Committee.

More than one hundred ($N = 108$) responses were collected, mainly from Italy ($N = 48$; 51.9%) and UK ($N = 31$, 28.7%). Sport-based rehabilitation interventions were reported to be ongoing (at the time of the survey) in 65.7% of cases ($N = 71$), mainly in UK (80.6%, $N = 25$) and Finland (94.1%, $N = 16$) (Table 1). These interventions were usually carried out in collaboration with sports/clubs/associations/organizations.

In 39.1% of cases ($N = 36$), psychosocial rehabilitative interventions based on structured physical exercise and/or sports are offered to all patients in charge of the mental health service. Interventions including physical activity are offered to selected patients, based on the severity of patient's condition (Italy) or their own preference (Table 2).

Table 1. Provision of interventions involving structured physical exercise and/or sports by mental health services.

	All ($n = 108$)		Italy ($n = 48$)		UK ($n = 31$)		Romania ($n = 12$)		Finland ($n = 17$)	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
Currently on going	71	65.7	27	56.3	25	80.6	3	25.0	16	94.1
Concluded	20	18.5	12	25.0	5	16.1	3	25.0	0	0.0
Never implemented	15	13.9	9	18.8	1	3.2	4	33.3	1	5.9
NA	2	1.9	0	0.0	0	0.0	2	16.7	0	0.0
Collaboration with sports/clubs/associations/organizations*										
	All ($n = 92$)		Italy ($n = 39$)		UK ($n = 30$)		Romania ($n = 7$)		Finland ($n = 16$)	
Yes	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
No	43	46.7	23	59.0	4	13.3	6	85.7	10	62.5

*Responses collected only from those reported that the intervention subsample of units providing interventions involving structured physical exercise and/or sports ("Currently active" and "Provided in the past" in Table 1).
n.a.: not available.

Table 2. Target of psychosocial rehabilitative intervention based on structured physical exercise and/or sports.

	All ($n = 92$)		Italy ($n = 39$)		UK ($n = 30$)		Romania ($n = 7$)		Finland ($n = 16$)	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
All patients in charge at the mental health service	36	39.1	6	15.4	20	66.7	1	14.3	9	56.3
All patients (based on the severity of the clinical condition)	17	18.5	14	35.9	1	3.3	1	14.3	1	6.3
Mainly patients suffering from psychotic disorders	1	1.1	1	2.6	0	0.0	0	0.0	0	0.0
Mainly patients suffering from eating disorders	1	1.1	1	2.6	0	0.0	0	0.0	0	0.0
Mainly patients suffering from affective disorders	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mainly patients suffering from anxiety spectrum disorders	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
All patients are invited but included only on the basis of individual preference (regardless of the diagnosis)	33	35.9	15	38.5	9	30.0	4	57.1	5	31.3
Other	2	2.2	1	2.6	0	0.0	0	0.0	1	6.3
NA	2	2.2	1	2.6	0	0.0	1	14.3	0	0.0

NA: not available.

In 43.5% of cases, interventions involving structured physical exercise and/or sports did not receive any ordinary funding from health care systems. In Italy and Romania, most of the services appear to have no access to dedicated funds to carry out sport-based interventions, in UK and Finland mainly public health funds or private funds or a combination of public/private funds were used (Table 3).

Rehabilitation interventions involving structured physical exercise and/or sports have different aims, including the promotion of healthy lifestyles (in all countries), the promotion of social integration (Italy and UK), the improvement of social skills and reduction of clinical symptoms (UK and Finland) (Table 4).

The most frequent exercise/sport included in the intervention were walking (68.5%, $N = 63$), football/five-a-side football (56.5%, $N = 52$) and running (34.8%, $N = 32$) (Table 5). In the majority of cases, respondents reported to evaluate programs ('always' or 'sometimes') (Table 6), but while half of the

Table 3. Source of fundings for interventions involving structured physical exercise and/or sports.

	All ($n = 92$)		Italy ($n = 39$)		UK ($n = 30$)		Romania ($n = 7$)		Finland ($n = 16$)	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
No funding	40	43.5	26	66.7	6	20.0	5	71.4	3	18.8
Public health funding	21	22.8	7	17.9	8	26.7	1	14.3	5	31.3
Public social funding	5	5.4	2	5.1	2	6.7	0	0.0	1	6.3
Private funding	6	6.5	1	2.6	1	3.3	1	14.3	3	18.8
Different types of funding	10	10.9	2	5.1	5	16.7	0	0.0	3	18.8
Other	7	7.6	0	0.0	7	23.3	0	0.0	0	0.0
NA	3	3.3	1	2.6	1	3.3	0	0.0	1	6.3

NA = not available.

Table 4. Aims of the interventions involving structured physical exercise and/or sports.

	All ($n = 92$)		Italy ($n = 39$)		UK ($n = 30$)		Romania ($n = 7$)		Finland ($n = 16$)	
	n	%*	*n*	%*	*n*	%*	*n*	%*	*n*	%*
Reduction of severity of clinical symptoms	62	67.4	19	48.7	24	80.0	5	71.4	14	87.5
Improvement in social skills	67	72.8	26	66.7	25	83.3	3	42.9	13	81.3
Promotion of social integration	70	76.1	35	89.7	24	80.0	3	42.9	8	50.0
Improvemente in cognitive functioning	36	39.1	17	43.6	12	40.0	3	42.9	4	25.0
Leisure activity	56	60.9	19	48.7	22	73.3	6	85.7	9	56.3
Promotion of healthy lifestyles	80	87.0	32	82.1	28	93.3	6	85.7	14	87.5
Other	19	20.7	4	10.3	0	0.0	0	0.0	15	93.8
NA	1	1.1	1	2.6	0	0.0	0	0.0	0	0.0

*More than one answer is possible, percentages are computed out of the number of services instead of the number of aims listed (the sum of individual percentages exceeds 100%). NA: not available.

Table 5. Type of sport/exercise included in the rehabilitation intervention.

	All ($n = 92$)		Italy ($n = 39$)		UK ($n = 30$)		Romania ($n = 7$)		Finland ($n = 16$)	
	n	%*	*n*	%*	*n*	%*	*n*	%*	*n*	%*
Walking	63	68.5	27	69.2	18	60.0	3	42.9	15	93.8
Football/Five-a-side football	52	56.5	16	41.0	25	83.3	2	28.6	9	56.3
Running	32	34.8	7	17.9	11	36.7	2	28.6	12	75.0
(Gentle) gymnastics[#]	29	31.5	21	53.8	0	0.0	1	14.3	7	43.8
Swimming	20	21.7	10	25.6	0	0.0	0	0.0	10	62.5
Thai Chi	15	16.3	0	0.0	15	50.0	0	0.0	0	0.0
Tennis	12	13.0	0	0.0	9	30.0	3	42.9	0	0.0
Volleyball	8	8.7	5	12.8	0	0.0	1	14.3	2	12.5
Basketball	7	7.6	0	0.0	6	20.0	1	14.3	0	0.0
Horse riding	5	5.4	3	7.7	0	0.0	0	0.0	2	12.5
Table tennis	4	4.3	0	0.0	4	13.3	0	0.0	0	0.0
Yoga	4	4.3	0	0.0	4	13.3	0	0.0	0	0.0
Sailing	2	2.2	2	5.1	0	0.0	0	0.0	0	0.0
Skiing	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Other	45	48.9	4	10.3	27	90.0	2	28.6	12	75.0
NA	3	3.3	2	5.1	0	0.0	1	14.3	0	0.0

*Since participants could list more than one type of sport (multiple answers could be selected), percentages are computed out of the number of services instead of the number of types of sport listed (the sum of individual percentages exceeds 100%). n.a.: not available.
[#]Includes coordination, breathing, postural, joint mobility, muscle awakening, stretching.

Table 6. Evaluation of rehabilitation interventions in terms of monitoring and assessment of effectiveness.

	All ($n = 92$)		Italy ($n = 39$)		UK ($n = 30$)		Romania ($n = 7$)		Finland ($n = 16$)	
	n	%	*n*	%	*n*	%	n	%	n	%
Programs always evaluated	40	43.5	17	43.6	14	46.7	1	14.3	8	50.0
Programs sometimes evaluated	35	38.0	11	28.2	14	46.7	3	42.9	7	43.8
Programs never evaluated	16	17.4	10	25.6	2	6.7	3	42.9	1	6.3
NA	1	1.1	1	2.6	0	0.0	0	0.0	0	0.0

Table 7. Tools used for monitoring of the rehabilitation interventions*.

	All ($n = 75$)		Italy ($n = 28$)		UK ($n = 28$)		Romania ($n = 4$)		Finland ($n = 15$)	
	n	%	n	%	n	%	n	%	n	%
Validated tools	25	33.3	6	21.4	14	50.0	1	25.0	4	26.7
Non-validated tools	21	28.0	9	32.1	5	17.9	1	25.0	6	40.0
Physiological/health parameters	9	12.0	8	28.6	1	3.6	0	0.0	0	0.0
NA	20	26.7	5	17.9	8	28.6	2	50.0	5	33.3

*subsample of units monitoring rehabilitation interventions ("Programs always evaluated" and "Programs sometimes evaluated" in Table 6). n.a.: not available.

services from the UK reported using validated tools, in the other countries the use of validated tools was less frequent (Table 7).

Discussion

Given the well-documented reduced life expectancy (by 15 to 25 years) for individuals with severe mental disorders compared to the general population, urgent actions are needed in all countries and continents (Fiorillo et al., 2019; Fiorillo & Sartorius, 2021). Physical exercise and sport-based interventions have gained increasing interest in the last years, as some of the most important strategies to significantly reduce this mortality gap. Among people with mental disorders, physical activity and sport-based interventions have been found to improve not only physical health (e.g. reduction of metabolic disorders), but also quality of life, recovery, empowerment and life's satisfaction. However, the levels of physical activities practiced by people with severe mental disorders are still far below the WHO recommended thresholds (WHO, 2013, 2020).

According to the EASMH survey, sport-based psychosocial interventions are not frequently available in mental health services, with significant differences at the European level. Furthermore, in many cases sport-based interventions are funded by private associations or charities, confirming that public health systems are not currently prioritizing the promotion of sport activities for the mental health of people with severe mental disorders (Knapp & Wong, 2020). Although different healthcare systems have allocated additional funds to mental health care in order to enable people with severe mental disorders to access psychosocial therapies and to improve physical health care, no specific focus has been placed on sport and physical activity (UK Department of Health and Social Care, 2021). Furthermore, at the European level, a recent WHO report states that 78% of the countries have an established government coordination mechanism for the promotion of health-enhancing physical activity, with programmes focussed on vulnerable populations, including people from low socioeconomic status, older adults and people with disabilities. However, no specific focus on people with severe mental disorders has been considered (WHO Regional Office for Europe, Report 2018).

Moreover, sport-based interventions are only rarely provided in clinical routine care, although some relevant initiatives have been proved to be successful, including the Italian programme 'Crazy for Football', with a team of Italian patients with severe mental disorders winning the Champions Cup and whose story has also become a movie (https://www.crazyforfootball.org/). Therefore, the EASMH surveys' findings, although derived from a limited number of participants, indicate the need to promote a radical shift in the provision of long-term care to people with severe mental disorders, with the promotion of a global recovery, encompassing physical health and not only the remission of clinical symptomatology.

Another interesting finding is related to the type of sport activity provided to patients with severe mental disorders. Across participating countries, a significant variation in sport activities proposed to patients – ranging from walking and running to football – has been found. It has been widely documented that team-based sport activities (such as football) are particularly useful for patients with severe mental disorders – such as schizophrenia – in order to improve their social ability and interactions with other people, while other physical activities (such as walking and running) are very effective in improving cardiorespiratory fitness (Gordon et al., 2018). However, in the present survey, reasons for selecting a specific sport activity to be offered to patients have not been evaluated, while this represents a very sensitive issue for increasing patients' participation rate and attendance rate to sport-based intervention. In fact, in the process of selecting the type of sport activity to propose to patients with severe mental disorders, it is necessary to consider some factors such as motivation, self-efficacy, perceived barriers (such as cost or lack of time), and physical activity history and skills. Therefore, all these aspects should become a specific focus of future initiatives promoted within the EASMH project.

Finally, a critical aspect of the sport-based interventions provided in the surveyed countries is related to the lack of a rigorous assessment/monitoring of the effectiveness of the interventions. In fact, only in the UK the majority of respondents reported using validated assessment tools. This represents a very relevant element to be improved in order to collect an increasing number of evidences, related to sport-based interventions to be delivered in the clinical routine practice.

Our findings show that the countries where sport-based interventions are applied more rigorously are UK and Finland, although the low number of respondents in the latter country should be considered. This may be due to the fact that in these countries decisions on the allocation of public funds really consider sport as a useful activity to be provided to patients with severe mental disorders. In Italy, despite more than 40 years of community psychiatry legislation, these interventions are applied only rarely and in some isolated cases. The reason may be that mental health professionals do not consider these approaches as useful and effective, compared to other evidence-based psychosocial interventions. Robust studies with a well-designed methodology, aiming to compare the efficacy of the different sport-based interventions with other psychosocial interventions, and head-to-head studies comparing the different sport activities, are highly recommended in order to strengthen data on the efficacy and effectiveness of these interventions.

As stated in one of the EPA guidance (Stubbs et al., 2018), better treatment outcomes can be reached when physical activity interventions are delivered by qualified exercise professionals. The potential benefits of training mental health staff (e.g. psychologists, psychiatric nurses) on principles of physical activity in delivering exercise interventions should also been evaluated in more detail (McEwen, 2020). However, sport professionals often lack a specific training on how to engage, motivate and develop a personalized sport intervention for people with severe mental disorders. Recently, a set of guidelines were developed to provide recommendations for sport practitioners (such as sports coaches, fitness instructors, etc.), as well as health professionals (such as psychiatrists, physiotherapists, mental health nurses, etc.), with the final aim of supporting them to design, implement and evaluate sport and physical activity opportunities for people with mental disorders (Cross-Villasana et al., 2019).

Given the compelling neurobiological and clinical data available on the potential for sport and physical activity to impact favourably on the life and health of people with mental disorders there is a string need to promote the integration and collaboration between mental health professionals and sport professionals, favouring also the dissemination and availability of sport-based interventions in routine clinical practice.

In order to improve the availability and dissemination of sport-based interventions for people with severe mental disorders, several actions should be taken, targeting different levels including that of policy-makers, of healthcare and sport professionals through education and training and of general population, increasing awareness on these topics (Unützer et al., 2020). The EASMH project aims to fill all these aspects by creating and international 'alliance' or network of collaborators, researchers and stakeholders with different backgrounds in order to improve the dissemination of sport-based rehabilitation interventions and by developing an innovative training programme for sport coaches in order to improve their skills in interacting and building an effective relationship with people with severe mental disorders.

Disclosure statement

The authors report there are no competing interests to declare.

Acknowledgments

The EASMH (European Alliance for Sport and Mental Health) project has been funded by the Erasmus+ Programme of the European Union (Grant Agreement number: 622832-EPP-1-2020-1-IT-SPO-SCP).

Funding

The present work has been promoted as part of the activities of the EASMH Project funded by the ERASMUS+ Programme.

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Data availability statement

Not applicable.

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