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ORIGINAL ARTICLE

Physiotherapy program and acute mental disorders: exercise as a tool to manage physical and psychopathological symptoms to prevent chronic conditions

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Summary

Objective. The aim of this study is to evaluate the impact of a physiotherapy program in a psychiatric ward in reducing "Anxiety", "Depression" and "Motor Tension" as well as in improving perceived well-being.

Method. A physical exercise program was implemented in the Psychiatric Ward of San Camillo de Lellis Hospital from January to June 2024. The program took place two times per week of about 45 minutes each and involved 35 patients who voluntarily participated.

Results. Although preliminary, the data, suggest that a structured physical activity program has a positive impact on the recovery from a psychopathological condition and on the subjective well-being perceived by patients hospitalized in a psychiatric ward. The improvement is perceived by users especially on the dimensions related to mood, anxiety and motor tension. The perceived effectiveness on muscle motor tension also seems to affect the duration of hospitalization.

Conclusion. Our results are of particular interest both in terms of health policy and in the prevention of problems related to a long hospitalization. Further investigation is needed to confirm these preliminary results that show the efficacy of physical activity on sever mental diseases starting from the acute phase.

Keywords: physiotherapy, well-being, mood, anxiety and motor tension

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INTRODUCTION

The World Health Organization (WHO) in 2018 stated that "Mental health is an integral part of health, indeed, there is no health without mental health" [1] overcoming the *body vs mind* dichotomy and reinforcing the definition of mental health as "a state of well-being in which an individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and is able to make a contribution to his or her community" [2]. This is a cornerstone in well-being promotion highlighting the relationship between mental and physical health and the interplay with social factors. However, the treatment of psychiatric disorders, is still mainly oriented towards the recovery of mental well-being poorly focusing on the role of body in this process. Literature underline the prominence, and the physical and psychological benefits, of the body-based approach in many mental disorders, in preventing disabilities related

to a sedentary lifestyle, drug intake and inadequate nutrition, often found in this population [3].

Physiotherapy treatment in mental health make sense because the body is involved in mental disorders and this practice can modify the suffering perceived by the patient [4]. Physiotherapy represent, not just a therapeutic response to a somatic diagnosis that aims to reduce pain or improve the subject's motor performance, but can also be helpful in increasing the body and emotional awareness of psychiatric patients. The main goal of the physiotherapist in psychiatry is, therefore, to work on the bodily manifestation of mental distress and act to reduce its physical symptoms, determining at the same time a psychoemotional benefit.

Despite several studies underlined its importance, physiotherapy is considered as an unnecessary and no first line treatment in patient with psychiatric problems. However, in some country as Belgium the physiotherapists can be trained to work in this field, both in the acute and chronic setting, and several studies have been conducted to evaluate the effectiveness of various rehabilitation interventions such as aerobic training, passive and active mobilization, muscle relaxation [5].

Physical exercise could also represent a low-cost treatment in the prevention and treatment of age-related neurodegenerative processes in mental disorders. Physical exercise performed at average intensity, reduces drugs side effects, promotes the release of neurotransmitters and increases cerebral blood flow [6-9].

In 2011 the World Confederation of Physical Therapy (WCPT) accepted a specialty group named The International Organization of Physical Therapy in Mental Health (IOPTMH). This WCPT subgroup was settled by a network of physiotherapists organizations from 31 countries working in the field of psychiatry and mental health.

The IOPTMH has drawn up a guidance document with the aim of providing specific indications in physiotherapy training programs in the field of mental health care and the specific skills related to the treatment of mental disorders that must be acquired by general and specialized physiotherapists [5].

In January 2024, a new therapeutic rehabilitation activity started at the Psychiatric ward (SPDC) of the "San Camillo de Lellis" Hospital of the ASL of Rieti. A Physiotherapy program was implemented in collaboration with the Physical Medicine and Rehabilitation Unit.

This intervention was part of the broader project "Revaluation and reorganization of clinical and rehabilitation activities within the Psychiatric Ward of Rieti".

The project, lasting six months, was aimed to achieve the following objectives:

- reduce the distress related to hospitalization for patients with psychiatric disorders in the acute psychopathological phase by reducing the state of inactivity and/or immobility;
- change the grief perceived by the patient by trying to restore homeostasis between mind and body;
- reduce the physical symptoms of mental disorders, determining at the same time a psychoemotional benefit;
- promote healthy lifestyles to prevent chronic somatic conditions.

The aim of this study is to evaluate the impact of physiotherapy program and to verify the expected results, i.e. a reduction in the psychopathological dimensions "Anxiety", "Depression" and "Motor Tension" as well as an improvement in the well-being perceived by participants.

MATERIALS AND METHODS

The naturalistic study involved subjects consecutively hospitalized at the SPDC of the "San Camillo de Lellis" Hospital of the ASL of Rieti from January 15 to June 30, 2024 who voluntarily participated to the physiotherapy program.

Because of the lack of training on mental health for physiotherapist, a preliminary phase of training on psychiatric pathologies and on pharmacological treatments as well as on the methods of approach and communication and on the problems of specific interest, was implemented. During the preliminary phase the kind of activities to carry out were discussed.

Participants gave their informed consent to participate at the time of admission within the informed consensus to the proposed interventions and to the processing of data for research purposes. The data reported in this study are those used for the clinical activity in order to formulate an individualized therapeutic project and evaluate the treatment outcome.

The physical exercise program included the use of aids, such as chairs, mats and a stopwatch. The physical activity was performed both in a standing position and lying in various positions on the mat.

Two sessions per week of about 45 minutes have been carried on including the following exercises:

- stretching of the main muscle groups;
- spatial orientation and body proprioception exercises (static proprioception and movement of body segments);
- assisted and free active movement;
- muscle coordination exercises;
- muscle strengthening.

The physical exercise program carried out aimed to act on two conditions:

- *Immobility*, extremely relevant in the acute phase of the disorder and in some cases also during pharmacological treatment. It refers to a group of signs and symptoms that must be prevented and adequately treated because can lead to a reduction in muscle tropism, in strength and power, increasing in the percentage of adipose tissue, joint stiffness, altering of posture and balance.
- *Alteration of muscle tone*, hypertonia or hypotonia, can be temporary or can persist for a long period of time and in this case if not treated adequately, can lead to secondary problems such as joint limitations, muscle-tendon retractions and pain.

The exclusion criteria for the eligibility to the program participation were: excessive state of sedation, presence of severe

conceptual disorganization or severe behavioural alterations.
The evaluation was carried out in two different times, at the time of admission (T0) and at discharge (T1), through the following psychometric instruments:

- *General Health Questionnaire- 12* (GHQ-12): is a 12-item self-assessment test that evaluates adaptation patterns associated with distress [10]. The subject is asked to compare his/her current situation with his/her usual psychological state, choosing between four response modes: "as usual", "more than usual", "less than usual", "much less than usual". In this way it is possible to distribute individuals along a continuum whose extremes are constituted by a condition of psychological well-being or problems related to distress. The scale provides a Likert-type score through the assignment of a 0-1-2-3 score corresponding to the four choice options for each question.
- *Brief Psychiatric Rating Scale* (BPRS): is a 18 items scale by witch the clinician evaluates the presence and severity of symptoms [11 12]. The score of each item is evaluated on a 7-point scale ("absent", "very mild", "mild", "moderate", "medium severity", "severe" and "very severe") in addition to "not assessed" (= 0). The sum of the scores of the individual items provides a total score, which can reasonably be considered as an expression of the severity of the mental disorder.

Finally, a *Satisfaction Questionnaire* to determine the degree of perceived usefulness of physiotherapy was administered at the moment of the discharge. The questionnaire is a 4 items tool that investigate the usefulness of the intervention as a whole ("How useful was it to you to practice physiotherapy during hospitalization?") and on the dimensions "Anxiety" ("How much did it help you manage anxiety?"), "Motor tension" ("How much did it help you manage your level of muscle tension?") and "Mood" ("Did participating in the group improve your mood?") with the assignment of a score comprised from: 0 = not at all; 1 = partly; 2 = a lot.
The score can be computed in two different ways:

- continuum evaluation by a total score (range 0-8);
- nominal evaluation by computing the percentage of patients that choose every alternative of each item.

Statistical analysis was performed using the Statistical Package for Social Science (SPSS). The comparison between the mean scores in the two evaluation times was performed using the ANOVA for repeated measures (T0 vs T1). The calculation of the correlation coefficients between the variables was performed using the Pearson Product Moment (r). All analyses with a $p \leq 0.05$ were statistically significant.

RESULTS

The Physiotherapy program involved 35 subjects (17 males and 18 females), with an average age of 38.20±15.42 and an education of 10.3±3 years, consecutively hospitalized from January 15 to June 30, 2024.
Participants received the following ICD-9 CM diagnosis: 48.6% (N = 17) Psychotic Disorder, 20% (N = 7) Depressive Disorder, 2.9% (N = 1) Bipolar Disorder and 28.6% (N = 10) Personality Disorder. Eleven of the 35 participants also had a comorbidity for Substance Use Disorder: 14.3% (N = 5) alcohol abuse/dependence, 5.7% (N = 2) cocaine abuse/dependence, 5.7% (N = 2) cannabis abuse/dependence, 2.9% (N = 1) opioid abuse/dependence and 2.9% (N = 1) other psychotropic substance abuse/dependence.
The mean length of hospitalization was 11.8±4.3 and the mean number of physiotherapy sessions was 1.7+0.8.
Psychopathology assessed with the BPRS showed a significant reduction (T0 vs T1) both in the total score (44.4±11 vs

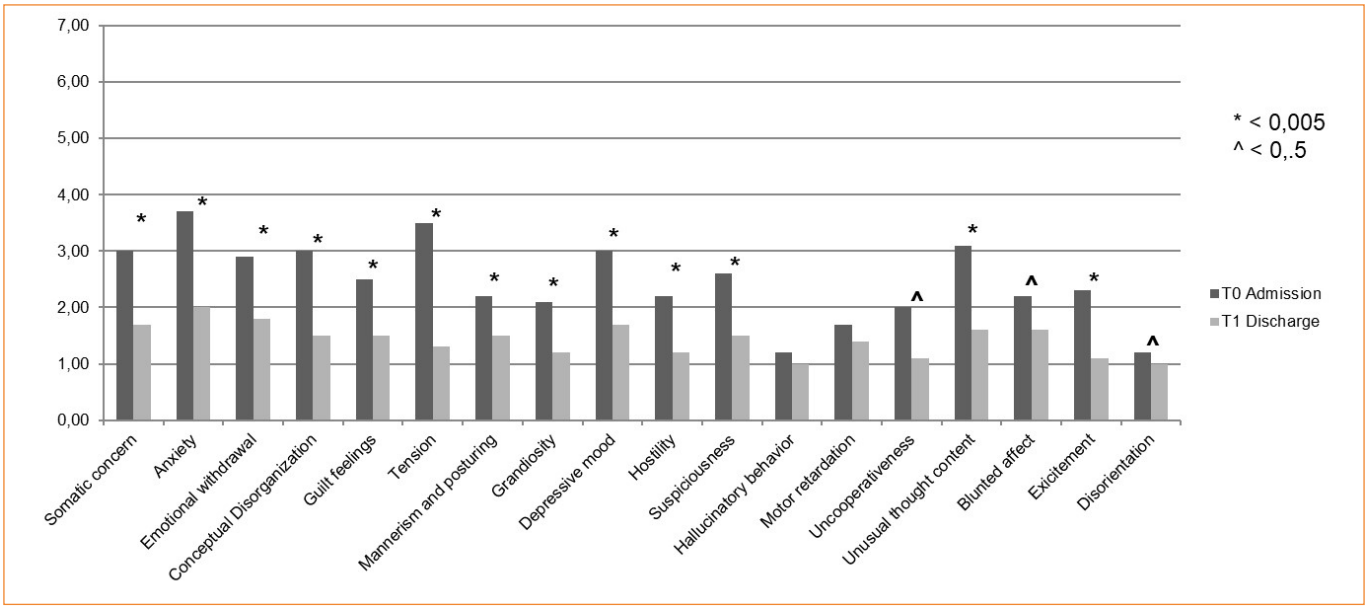

FIGURE 1. Psychopathological dimensions assessed at the admission (T0) and at discharge (T1)

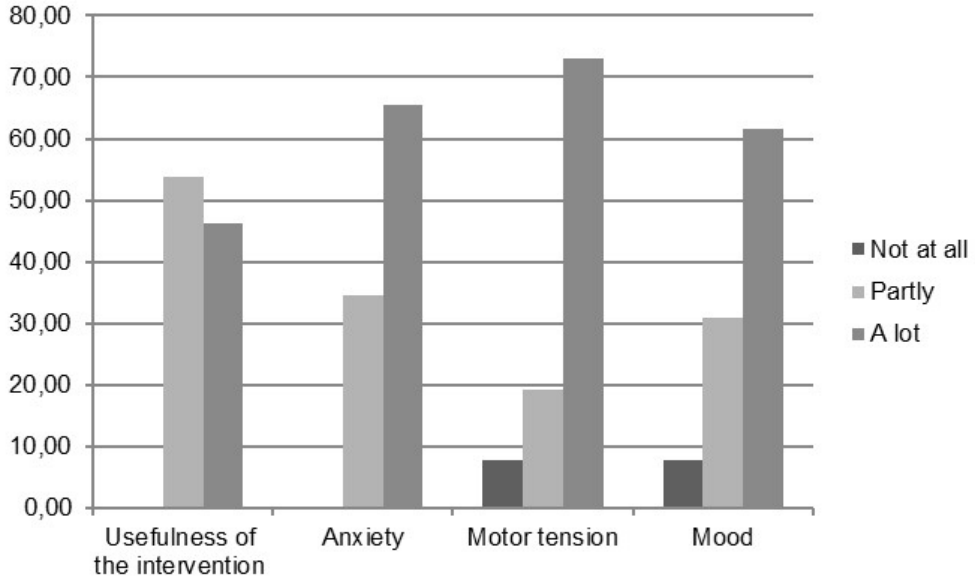

FIGURE 2. Satisfaction with physiotherapy program.

25.9±4.5; F = 1024.25; s = .000; gdl = 1) and in all dimensions but for Hallucinations and Motor Retardation (Fig. 1).

The GHQ-12 scores showed a significant improvement in perceived well-being (T0 vs T1): (24.6±4.9 vs 15.11±5.8; F = 1024.25; s = .000; gdl = 1).

Data from the Satisfaction Questionnaire show an average score of the degree of perceived usefulness of 6.58±1.6. The percentage values of each alternative are reported in Figure 2. To the question "How useful was physiotherapy during your hospitalization?" 53.8% of patients answered "partly" while 46.2% answered "very useful". No participants considered physiotherapy "not useful". To the question "How much did it help you manage your anxiety?" 34.6% answered "partly" and 65.4% "very" useful. No one answered "not at all" useful. To the question "How much did it help you manage your level of muscle tension?" 7.7% answered "not at all", 19.2% "partly" and 73.1% "very useful". Lastly, to the question "Did participating in the group improve your mood?" 7.7% answered "not at all", 19.2% "somewhat" and 73.1% "very" useful.

The analysis of the correlations shows a negative correlation between the average score of satisfaction for the muscle tension reduction and the days of hospitalization ($p < .05$; r: -.43) and positive correlations between the average score of the usefulness of the activity performed and the average score on the usefulness of the activity in mood ($p < .01$; r:. 63) and muscle tension ($p < .01$; r:. 70) dimensions.

DISCUSSION

Life expectancy for adults with mental illness is lower than that the general population and this is largely due to poor physical health [13]. Therefore physical activity has been consistently recommended for the prevention and management of many chronic physical health conditions and may also have mental health benefits [7]. Physical inactivity and the lack of lifestyle choices could be manageable risk factors to improve life expectancy of patients with psychiatric disorders. Furthermore, physical activity represents an effective and low-cost intervention for symptomatic improvement for many psychiatric disorders so much so that in 2019 the Ministry of Health indicated in the Guidelines for physical activity that "Lifestyle interventions aimed to promote the entrance of physical activity into daily life and structured, supervised and easy-to-perform physical activity programs are effective for people with psychiatric disorders" [14].

In the last decade, several studies evaluated the clinical and psychosocial benefits and neurobiological correlates of physical activity on mental disorders [15-19]. A recent review of the literature highlighted that physical activity reduces sleep disturbances and has a positive impact on many psychiatric disorders such as depression and anxiety disorders and reduces craving for alcohol [9]. The reported evidence also suggests that physical exercise is associated with an improvement in management of psychotic symptoms and the treatment of medical comorbidities that comes with these disorders [9]. The improvement of symptoms from a neurophysiopathological point of view seems to be related to the following factors [5-8]: improved functioning of the HPA axis which leads to a reduction in cortisol levels and the restoration of a balance in the production of leptin and ghrelin; increased plasma BDNF; increased B-endorphins which produces a reduction in anxiety-depressive symptoms; increased various neurotransmitters such as serotonin, dopamine, acetylcholine and norepinephrine.

Although we cannot rely on homogeneous studies within hospital settings respect to efficacy assessment tools and sort of activity programs, in a recent meta-analysis of 132

studies Tew et al. [20] found that hospital-based physical activity programs offer the opportunity to improve the physical and mental health of patients. The results of our study, although preliminary, demonstrate the effectiveness of a structured physical activity program carried out by qualified staff, especially in relation to the improvement of symptoms related to tension, anxiety and mood and to an improvement in perceived well-being. Although most of the psychopathological dimensions assessed with the BPRS are, in fact, significantly improved upon discharge, the activity performed seems to have influenced especially the three dimensions mentioned above, as highlighted by the satisfaction questionnaire in which patients reported the significant usefulness of the intervention. The improvements relating to the symptomatic dimensions and perceived well-being may, in fact, be due to the global and person-centred intervention carried out during hospitalization or to the interviews with healthcare staff, to the psychopharmacological therapy and to the psychoeducational interventions that are part of the integrated treatment proposed daily in our ward. On the other hand, results of the satisfaction questionnaire administered to patients who have undergone the physical treatment, represent an index of the effectiveness of the proposed treatment.

The findings of our study confirm what emerged in previous, although few, studies. For example, Morres et al. [21] reported that aerobic activity can be considered an effective antidepressant intervention in both outpatients and inpatients, regardless of the severity of symptoms. Fraser et al. [22] also highlight that a physical activity intervention in a hospital setting can help reduce the burden of chronic diseases and improve psychological well-being in adults with psychiatric disorders.

Furthermore, results show the correlation between the satisfaction reported by patients for the improvement of the state of tension following the motor intervention performed and the reduction of the length of hospitalization. This data is relevant both in terms of health policy and in the prevention of problems related to a long hospitalization. To our knowledge, the literature lacks data relating to the effect of a physical activity program on the reduction of the length of hospitalization in psychiatric settings.

The limitations of our study are mainly represented by the lack of a control sample and the small sample size. However, the reported data are preliminary and require further investigations in the future that consider these limitations. Although the heterogeneity of the diagnostic categories of our sample and the presence of comorbidity with a SUD can be considered limitations they refer to a clinical population representative of the real clinical world.

CONCLUSIONS

Although preliminary, the data reported in the study suggest that a structured physical activity program has a positive impact on the recovery from a psychopathological condition and on the subjective well-being perceived by patients hospitalized in an acute department. The improvement is perceived by users especially on the dimensions related to mood, anxiety and motor tension. The perceived effectiveness on muscle motor tension also seems to affect the duration of hospitalization.

Therefore, emerges the importance of carrying out further studies to collect data supporting the role of physical activity programs to manage the well-known risk factors that affect the well-being and quality of life of patients with severe mental disorders.

Conflict of interest statement

The authors declare thath the research was conducted in the absence of any commercial of finantial relationships thath could be constructed as a potential conflict of interest.

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Authors contributions

A.T., C.P. and S.T.: write the original draft, data curation, statistical analysis, conseptualization and supervision. P.M., E.V., F.F. and A.M.: data curation. D.P.S. and V.M.: critical revision of the manuscript. All final approval of the manuscript.

Ethical consideration

This study was conducted in accordance with globally accepted standards of good practice, in agreement with Declaration of Helsinki. The study is naturalistic study in real clinical world. Participants gave their informed consent to participate at the time of admission within the informed consensus to the proposed interventions and to the processing of data for research purposes. The data reported in this study are those used for the clinical activity in order to formulate an individualized therapeutic project and evaluate the treatment outcome. For these reasons the study has not been prior submitted to an ethics committee.

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