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Article

Physiotherapy Within Inpatient Mental Health Wards: Involvement, Diagnoses, and Lifestyle Characteristics

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Abstract: Background: Severe mental illness (SMI) is often linked to physical health issues, including multiple comorbidities. Physiotherapists are increasingly recognized for their role in addressing these health disparities. This study investigated the role of physiotherapy in managing physical health conditions in individuals admitted to inpatient mental health services. Objective: The primary aim was to examine the prevalence of physical comorbidities among individuals admitted to inpatient mental health services, comparing those referred to physiotherapy versus those not referred. Secondary aims included assessing the relationship between physiotherapy referral and admission duration and identifying patterns in referral likelihood based on primary and comorbid diagnoses. Methods: A data linkage analysis was conducted using records from Tees, Esk and Wear Valleys NHS Foundation Trust, encompassing admissions from September 2020 to January 2023. Demographic data, physiotherapy referral status, and SNOMED-CT coded diagnoses were analyzed. Results: Among 2150 admissions, 505 (23.5%) were referred for physiotherapy. Multimorbidity was present in 58.1% of admissions, with a higher prevalence (67.8%) in those referred to physiotherapy versus those not referred (55.1%). Individuals referred to physiotherapy had longer lengths of stay (117.3 days), compared to those not referred (44.1 days), suggesting that extended stays may indirectly facilitate the identification and management of physiotherapy needs. Referral likelihood was influenced by primary diagnoses and comorbidities. Conclusions: Approximately one in four inpatient admissions resulted in a physiotherapy referral, with a higher prevalence of multimorbidity in those referred. Further research is warranted to explore the long-term impacts of physiotherapy interventions on physical and mental health outcomes.

Keywords: physiotherapy; mental health; physical health; inpatient; lifestyle



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1. Introduction

The term severe mental illness (SMI) is commonly used to refer to mental health disorders that often impact an individual's ability to engage in personal, social, and occupational

activities [1]. Examples of such conditions often include schizophrenia, schizoaffective disorders, bipolar disorder, and major depression [2].

It is well-recognized that there is a complex and bidirectional link between physical and mental health [3,4]. As many as one in three people who have a long-term physical health condition also experience symptoms of mental illness, most commonly depression or anxiety [5]. This figure increases to seven in ten people when exclusively considering those experiencing SMI [6]. It is therefore unsurprising that these significant health inequalities result in a reduced life expectancy of around 10–20 years [7]. This is particularly alarming, given that a large proportion of these premature deaths are attributed to potentially modifiable behaviors and are therefore preventable [8].

Recent data suggest that the average annual healthcare costs for a person with SMI is about GBP 5000 [9]. Moreover, costs for people presenting with comorbid physical and mental health needs are found to need approximately GBP 2000 more than those without SMI [10]. It is therefore reasonable to assume that any optimization in treatment is likely to result in reduced financial costs and a reduction in the need for unplanned intervention from clinical services.

Mental health settings can be obesogenic due to restrictions on movement, reduced access to outdoor space, increased access to unhealthy food, and less control over food choices [11]. Despite this, in the right circumstances, the inpatient setting can provide an opportunity for healthcare professionals to initiate and support people with SMI in making positive lifestyle changes or addressing unresolved health issues [12–15]. Such health promotion activities may include access to a qualified professional to deliver interventions, social support of peers and healthcare professionals, education, and personalized goal setting and activity plans [16]. Physiotherapists, as professionals who are able to appreciate mind–body interactions, are well-positioned to help address this clinical need [17]. Various physiotherapy bodies have provided guidelines and recommendations on the topic of the potential influence of physiotherapists in improving both the physical and mental health of people with SMI [18,19].

A recent review summarized existing research regarding physiotherapy in mental health settings [20], documenting advances in a field that has expanded substantially since 2015. This review found substantial evidence supporting exercise and physical activity interventions but reported some ambiguity around other physiotherapy interventions, identifying the importance of understanding referrals into physiotherapy within a UK mental health context. Furthermore, there was also variation across countries, highlighting the need to understand need and resource at a local level via economic evaluations of physiotherapy interventions and for more consumer-driven or patient experience studies.

Given the sparsity of published research considering inpatient mental health physiotherapy services, this analysis utilized an established dataset based on all admissions to inpatient adult mental health services across an area of Northeast England (1 September 2020–30 January 2023). The primary aim was to examine the prevalence of physical comorbidities among individuals admitted to inpatient mental health services, comparing those referred to physiotherapy versus those not referred. Secondary aims included assessing the relationship between physiotherapy referral and admission duration and identifying patterns in referral likelihood based on primary and comorbid diagnoses.

2. Materials and Methods

A data linkage analysis was completed using data from inpatient mental health services within Tees, Esk and Wear Valleys NHS Foundation Trust and was registered and approved by the Trusts Clinical Audit and Effectiveness Team (Project Number: 7144AMH22). The data linkage approach allowed the integration of multiple datasets, providing a com-

prehensive view of patient demographics, diagnoses, and physiotherapy referrals. This approach enabled the identification of trends in referral patterns and comorbidities, offering real-world insights into clinical practices.

A Microsoft Excel database containing all physiotherapy referrals was kept from the point of service inception (September 2020). This database contained information including site, ward, method of referral, reason for referral, date referral received, date first assessment attempted, discharge date from physiotherapy, and any onward referrals made by physiotherapy. In addition, the number of physiotherapy contacts per week was recorded for each of the eight wards covered across the three physical sites. Although data collection is ongoing, this manuscript considered inpatient admissions and physiotherapy referrals received until 30 January 2023.

This database was combined with routinely collected data provided by the Trust Business Intelligence & Clinical Outcomes Department, which provided additional anonymized information for all admissions to these wards during this time. Additional information included: date of admission, date of discharge, patient age, gender, ethnicity, primary diagnosis, and up to five comorbidities. Primary diagnosis and comorbidities were exported directly from clinical records, and in cases where more than five comorbidities were present, only the five highest ranked (according to SNOMED CT code and by date) were exported. Further information regarding body mass index (BMI), weight, diabetes, smoking, drug and alcohol use, and physical activity records was also collected.

The 209 unique primary diagnoses and 810 unique comorbidities retrieved were combined into 32 broader categories independently by two reviewers (PH and EB) and cross-checked. A third reviewer (LH) was available in case there was no consensus between both reviewers, which was not the case. The 32 categories are listed within Appendix A.

Initial primary diagnosis and comorbidities were then transferred to the corresponding group. The presence of each diagnosis/comorbidity was binary-coded for each admission (0 = not present, 1 = present). Admissions were divided into distinct groups of those referred to physiotherapy versus those not referred to physiotherapy to allow for analysis and comparison between groups.

Data Analysis

Descriptive statistics are presented to provide an insight into population demographics, the length of physiotherapy involvement by diagnosis and comorbidities, length of admission for individuals referred to physiotherapy in comparison to individuals not referred during their admission, and the overall prevalence of the diagnostic or comorbidity categories between groups. As data did not meet normality assumptions, verified through the Shapiro–Wilk test, a Mann–Whitney U test was conducted to investigate the difference in overall length of admission for those referred to physiotherapy compared to those not referred. The Pearson chi-square test was used to assess relationships between categorical variables, such as referral reasons and diagnoses. Binary logistic regression was chosen to quantify associations between diagnoses and referral likelihood, providing odds ratios (ORs) and their respective 95% confidence intervals. All analyses were performed using IBM SPSS (version 29).

3. Results

There were, in total, 2150 admissions to adult mental health inpatient wards across three hospital sites and eight wards between 1 September 2020 and 30 January 2023. Of these admissions, 505 (23.5%) were referred for physiotherapy. Although the physiotherapy service covered inpatient settings only, due to a lack of community provision, four

additional community referrals were made and were therefore included in our analysis. Demographic information is detailed within Table 1.

Table 1. Demographics.

| Characteristic | Referred to Physiotherapy | Not referred to Physiotherapy | All Admissions |
|----------------------------|---|---|--|
| Age | 42.93 (14.56) | 44.40 (13.21) | 40.68 (13.59) |
| Gender | 253 Male 252 Female 4 Other | 862 Male 763 Female 20 Other | 1115 Male 1015 Female 24 Other |
| Length of admission (days) | 117.31 (237.45) | 44.09 (87.69) | 61.39 (142.07) |
| Ward Type | 375 Acute 63 Rehab 28 PICU 39 Eating disorders 4 Community (no provision) | 1396 Acute 4 Rehab 176 PICU 69 Eating disorders - | 1771 Acute 67 Rehab 204 PICU 108 Eating disorders 4 Community (no provision) |

Data are presented as mean and standard deviation where appropriate or by frequency for categorical variables. PICU = psychiatric intensive care unit.

3.1. Physical Health of Individuals Admitted to Inpatient Mental Health Services

Across the entire cohort, 58.13% of individuals admitted presented with two or more physical health comorbidities alongside their primary diagnosis (Table 2). Of these admissions, individuals referred to physiotherapy tended to have a greater number of physical health comorbidities (with 67.78% having two or more physical health comorbidities). In comparison, physical multimorbidity was still common in individuals not referred to physiotherapy (with 55.13% having two or more physical health comorbidities); however, it was much lower than in those individuals who were referred to physiotherapy during their inpatient admission. From this data, it appears that individuals with 1–2 comorbidities were less likely to be referred to physiotherapy, with individuals with 3+ comorbidities being more likely to receive a physiotherapy referral during their inpatient admission.

Table 2. Number of physical health comorbidities.

| Number of Physical Health Comorbidities | Referred to Physiotherapy n (%) | Not Referred to Physiotherapy n (%) | All Admissions n (%) |
|---|------------------------------------|--|-------------------------|
| 0 | 65 (12.77) | 332 (20.18) | 397 (18.43) |
| 1 | 99 (19.45) | 406 (24.68) | 505 (23.44) |
| 2 | 121 (23.77) | 445 (27.05) | 566 (26.28) |
| 3 | 108 (21.22) | 270 (16.41) | 378 (17.55) |
| 4 | 73 (14.34) | 139 (8.45) | 212 (9.84) |
| 5 | 43 (8.45) | 53 (3.22) | 96 (4.46) |
| Mean (SD) | 2.30 (1.47) | 1.78 (1.34) | 1.90 (1.39) |

Data are presented as frequency and percentage, followed by mean and standard deviation, for each group.

3.2. Prevalence of Physical Comorbidities Between Individuals Referred to Physiotherapy Compared to Those with No Physiotherapy Involvement

Table 3 shows the prevalences of the various physical comorbidities for individuals referred to physiotherapy in comparison to individuals not referred to physiotherapy. In both groups, the most common physical comorbidity was related to acute medical issues, with the next most common being metabolic and endocrine issues and gastrointestinal conditions, regardless of whether a physiotherapy referral was made. Differences between groups indicated that the presence of fatigue syndromes, musculoskeletal-related conditions, neurological issues, or pain was more common in those referred to physiotherapy.

Table 3. Prevalence of physical health comorbidities in individuals presenting to physiotherapy services vs. not referred to physiotherapy.

| Comorbid Diagnostic Grouping | Overall | Referred to Physiotherapy n (% Group) | Not Referred to Physiotherapy n (% Group) | LR Chi-Square | p-Value |
|---|---------|--|--|---------------|----------|
| Acute medical issues | 1175 | 260 (22.13) | 915 (77.87) | 9.14 | 0.058 |
| Cancer | 35 | 0 (0) | 35 (100) | 16.31 | <0.001** |
| Cardiovascular conditions | 408 | 119 (29.17) | 289 (70.83) | 9.93 | 0.042* |
| Dermatology issues | 162 | 48 (29.63) | 114 (70.37) | 9.09 | 0.028* |
| Fatigue syndrome | 13 | 7 (53.85) | 6 (46.15) | 5.53 | 0.019* |
| Gastrointestinal conditions | 358 | 125 (34.92) | 233 (65.08) | 18.93 | <0.001** |
| Lymphatic, rheumatic, and immunological disorders | 44 | 9 (20.45) | 35 (79.55) | 1.11 | 0.574 |
| Metabolic and endocrine disorders | 522 | 162 (31.03) | 360 (68.97) | 16.70 | 0.002* |
| Musculoskeletal (MSK)-related conditions | 270 | 109 (40.37) | 161 (59.63) | 32.66 | <0.001** |
| Neurodevelopmental disorders | 213 | 61 (28.64) | 152 (71.36) | 5.60 | 0.133 |
| Neurological disorders | 127 | 53 (41.73) | 74 (58.27) | 18.45 | <0.001** |
| Organic and neurodegenerative disorders | 115 | 30 (26.01) | 85 (73.99) | 1.80 | 0.407 |
| Pain | 130 | 44 (33.85) | 86 (66.15) | 7.17 | 0.028* |
| Reproductive conditions | 56 | 10 (17.86) | 46 (82.14) | 1.39 | 0.499 |
| Respiratory disorders | 318 | 89 (27.99) | 229 (72.01) | 7.97 | 0.047* |
| Somatoform-related disorders | 3 | 1 (33.33) | 2 (66.66) | 0.15 | 0.704 |
| Other physical health diagnosis | 150 | 45 (30.00) | 105 (70.00) | 3.23 | 0.199 |

Data are presented as frequency and percentage; LR = likelihood ratio; * significant when $p < 0.05$, ** $p < 0.001$.

3.3. Length of Physiotherapy Involvement by Reason for Referral and Primary Diagnosis

Table 4 details the length of physiotherapy involvement by reason for referral. Overall, individuals referred for mobility concerns were the largest single group, followed by the various musculoskeletal (MSK) categories. Average length of physiotherapy involvement was 26.72 days; however, a large variation was included within this. On average, individuals referred for input relating to functional neurological disorders tended to spend the longest amount of time involved with physiotherapy during their admission ($m = 246.60$ days), with involvement for all other primary diagnoses ranging from 5 days to 40 days.

Table 4. Length of physiotherapy involvement (days) by reason for referral.

| Reason for Referral Grouping | Number of Referrals | Total Time on Physio Caseload (Days) | Average Length of Physio Involvement (Days) | SD (Days) |
|--|---------------------|--------------------------------------|---|-----------|
| Chronic pain | 1 | 6.00 | 6.00 | N/A |
| Equipment | 2 | 10.00 | 5.00 | 5.66 |
| Functional neurological disorder | 5 | 1233.00 | 246.60 | 506.75 |
| Joint hypermobility | 4 | 43.00 | 10.75 | 2.99 |
| Lifestyle advice | 24 | 959.00 | 39.96 | 48.82 |
| Mobility | 126 | 4406.00 | 34.97 | 55.46 |
| MOD protocol | 51 | 221.00 | 4.33 | 9.21 |
| MSK—Extremities | 102 | 2769.00 | 27.15 | 40.92 |
| MSK—Multiple/Other | 19 | 600.00 | 31.58 | 41.29 |
| MSK—Spinal/Back pain | 89 | 1901.00 | 21.36 | 35.54 |
| Neuro | 17 | 476.00 | 28.00 | 42.64 |
| No information or discharged before assessment | 42 | 42.00 | 1.00 | 0.00 |
| Orthopedic/Trauma | 23 | 801.00 | 34.83 | 31.64 |
| Other | 3 | 116.00 | 38.67 | 34.70 |
| Respiratory | 1 | 15.00 | 15.00 | N/A |
| Overall | 509 | 13,598.00 | 26.72 | 65.07 |

MSK = Musculoskeletal; MOD = Ministry of Defence; N/A = Not applicable.

Table 5 details the length of physiotherapy involvement by primary diagnosis. Individuals with a neurodevelopmental primary diagnosis recorded tended to have the longest average physiotherapy involvement ($m = 120.36$ days), with involvement for all other primary diagnoses ranging from 8 days to 36 days.

Table 5. Length of physiotherapy involvement (days) by primary diagnosis.

| Primary Diagnosis Grouping | Number of Referrals | Total Time on Physio Caseload (Days) | Average Length of Physio Involvement (Days) | SD (Days) |
|--|---------------------|--------------------------------------|---|-----------|
| Anxiety disorders | 1 | 8.00 | 8.00 | N/A |
| Bipolar disorders | 50 | 1442.00 | 28.84 | 45.58 |
| Depressive and other affective disorders | 75 | 2089.00 | 27.85 | 61.98 |
| Drug and substance use/misuse | 31 | 368.00 | 11.87 | 19.98 |
| Eating disorders | 32 | 844.00 | 26.38 | 37.92 |
| Mania | 2 | 24.00 | 12.00 | 0.00 |
| Neurodevelopmental disorders | 11 | 1324.00 | 120.36 | 343.90 |
| Obsessive–compulsive or hypochondriacal problems | 3 | 11.00 | 3.67 | 4.62 |
| Organic and neurodegenerative disorders | 8 | 261.00 | 32.63 | 27.67 |
| Other non-mental health diagnosis | 15 | 542.00 | 36.13 | 56.30 |
| Personality disorders | 115 | 2562.00 | 22.28 | 36.11 |
| Psychosis-related disorders | 34 | 672.00 | 19.76 | 29.99 |
| PTSD and trauma | 18 | 247.00 | 13.72 | 21.82 |
| Schizoaffective disorders | 21 | 615.00 | 29.29 | 38.45 |
| Schizophrenia disorders | 78 | 2506.00 | 32.13 | 41.79 |
| Self-harm | 2 | 3.00 | 1.50 | 0.71 |
| Somatoform-related disorders | 3 | 17.00 | 5.67 | 8.08 |
| Stress disorders | 10 | 63.00 | 6.30 | 11.47 |
| Total | 509 | 13,598.00 | 26.72 | 65.07 |

PTSD = post-traumatic stress disorder; N/A = Not applicable.

3.4. Length of Admission (Physiotherapy Involvement Compared to Those Not Referred to Physiotherapy)

Table 6 displays the average length of admission by diagnosis for all admissions during the selected timeframe. Overall, individuals referred to physiotherapy generally had a longer admission (117 days) in comparison to individuals not referred to physiotherapy (44 days) ($U = 549,263.50$, $p < 0.001$).

Table 6. Length of admission (days) by primary diagnosis.

| | Overall | | | Referred to Physio | | | Not Referred to Physio | | | p-Value |
|--|----------------------|--------|--------------------|----------------------|--------|--------------------|------------------------|--------|--------------------|----------|
| | Total Admission Days | Mean | Standard Deviation | Total Admission Days | Mean | Standard Deviation | Total Admission Days | Mean | Standard Deviation | |
| Anxiety Disorders | 948 | 37.92 | 78.35 | 53 | 53 | N/A | 895 | 37.29 | 79.97 | 0.165 |
| Bipolar Disorders | 14,940 | 75.45 | 117.61 | 7483 | 149.66 | 191.16 | 7457 | 50.39 | 62.04 | <0.001 * |
| Depressive and other affective disorders | 15,958 | 50.34 | 105.96 | 9756 | 130.08 | 188.4 | 6202 | 25.63 | 35.07 | <0.001 * |
| Drug and substance use/misuse | 6829 | 27.21 | 62.73 | 1414 | 45.61 | 87.67 | 5415 | 24.61 | 58.17 | 0.016 * |
| Eating Disorders | 8175 | 83.42 | 55.48 | 3037 | 94.91 | 63.61 | 5138 | 77.85 | 50.67 | 0.303 |
| Mania | 562 | 35.13 | 38.1 | 68 | 34.00 | 25.46 | 494 | 35.29 | 40.31 | 0.700 |
| Neurodevelopmental Neurological Issues | 13,610 | 261.73 | 573.03 | 7216 | 656 | 1081.08 | 6394 | 155.95 | 268.83 | 0.049 * |
| Obsessive–compulsive or hypochondriacal | 45 | 22.50 | 20.51 | 0 | N/A | N/A | 45 | 22.50 | 20.51 | N/A |
| Organic and neurodegenerative disorders | 166 | 20.75 | 28.35 | 26 | 8.67 | 5.86 | 140 | 28.00 | 34.84 | 0.393 |
| Other mental health diagnosis | 1352 | 71.16 | 76.72 | 784 | 98.00 | 89.28 | 568 | 51.64 | 63.41 | 0.091 |
| Other non-mental health diagnosis | 165 | 10.31 | 9.24 | 0 | N/A | N/A | 165 | 10.31 | 9.24 | N/A |
| Personality Disorders | 12 | 6.00 | 2.83 | 0 | N/A | N/A | 12 | 6.00 | 2.83 | N/A |
| Psychosis-related disorders | 13,942 | 31.54 | 72.7 | 6336 | 55.10 | 119 | 7606 | 23.26 | 43.98 | 0.016 * |
| PTSD and Trauma | 12,939 | 56.01 | 83.71 | 2924 | 86.00 | 89.53 | 10,015 | 50.84 | 81.79 | <0.001 * |
| Schizoaffective disorders | 2799 | 49.98 | 125.68 | 1150 | 63.89 | 167.73 | 1649 | 43.39 | 102.05 | 0.150 |
| Schizophrenia Disorders | 7079 | 91.94 | 109.43 | 3524 | 167.81 | 160.09 | 3555 | 63.48 | 64.85 | 0.017 * |
| Self-harm | 31,780 | 133.53 | 188.71 | 15,745 | 201.86 | 238.07 | 16,035 | 100.22 | 149.08 | 0.002 * |
| Somatoform-related disorders | 121 | 7.56 | 5.64 | 17 | 8.50 | 7.78 | 104 | 7.43 | 5.65 | 0.817 |
| Stress Disorders | 75 | 12.50 | 14.04 | 68 | 22.67 | 13.32 | 7 | 2.33 | 2.31 | 0.100 |
| Overall | 735 | 17.09 | 46.46 | 110 | 11.00 | 10.87 | 625 | 18.94 | 52.77 | 0.899 |
| Overall | 132,232 | 61.39 | 142.07 | 59,711 | 117.31 | 237.45 | 72,521 | 44.09 | 87.67 | <0.001 * |

PTSD = post-traumatic stress disorder; N/A = Not applicable; * = significant when $p < 0.05$.

3.5. Relationship Between Primary or Comorbid Diagnoses and Reason for Referral to Physiotherapy

Several statistically significant relationships between primary and comorbid diagnoses and reason for referral to physiotherapy were determined through chi-square analysis (Table 7). The strongest relationships between reason for referral and primary diagnosis were for schizophrenia and MSK extremity ($X^2 = 121.06$); PTSD and depressive disorders; and Ministry of Defense (MOD) protocol ($X^2 = 25.53$ and 29.44 respectively). The strongest relationships between comorbidities and reason for referral were between neurological issues and respiratory referrals ($X^2 = 194.91$); neurological issues and neurology referrals ($X^2 = 113.09$); and metabolic and endocrine conditions and mobility referrals ($X^2 = 74.25$).

Table 7. Correlations between reason for physiotherapy referral and primary diagnosis and comorbidities.

| Referral Reason | Primary Diagnosis | Chi-Square Correlation (X^2) | p-Value | Comorbidities | Chi-Square Correlation (X^2) | p-Value |
|----------------------------------|--|----------------------------------|-----------|--|----------------------------------|-----------|
| Chronic Pain | Bipolar Disorders | 9.88 | 0.002 * | Dermatological Issues | 15.97 | 0.001 ** |
| | | | | MSK-Related Conditions | 9.36 | 0.025 * |
| Equipment | | | | MSK-Related Conditions | 46.30 | <0.001 ** |
| Functional Neurological Disorder | Neurodevelopmental Disorders | 6.58 | 0.01 * | Gastrointestinal Conditions | 24.75 | <0.001 ** |
| | Personality Disorders | 4.79 | 0.029 * | MSK-related Conditions | 66.11 | <0.001 ** |
| | | | | Neurodevelopment Disorders | 8.25 | 0.041 * |
| | | | | Neurological Issues | 37.63 | <0.001 ** |
| Joint Hypermobility | Personality Disorders | 7.29 | 0.007 * | MSK-Related Conditions | 19.62 | <0.001 ** |
| Lifestyle Advice | Schizophrenia Disorders | 23.15 | <0.001 ** | Dermatological Issues | 29.868 | <0.001 ** |
| | | | | Fatigue Syndrome | 5.14 | 0.023 * |
| | | | | Gastrointestinal Conditions | 8.82 | 0.032 * |
| | | | | Other | 10.16 | 0.006 * |
| Mobility | Bipolar Disorders | 13.17 | <0.001 ** | Acute Medical Issues | 12.82 | 0.012 * |
| | Drug and Substance Misuse | 6.17 | 0.013 * | Bipolar Disorders | 9.99 | 0.002 * |
| | Organic and Neurodegenerative Disorders | 8.05 | 0.005 * | Cardiovascular Conditions | 32.89 | <0.001 ** |
| | Psychosis-Related Disorders | 4.97 | 0.026 * | Drug and Substance Misuse | 15.44 | 0.009 * |
| | Schizophrenia Disorders | 12.51 | <0.001 ** | Fatigue Syndrome | 14.75 | <0.001 ** |
| | | | | Gastrointestinal Conditions | 59.86 | <0.001 ** |
| | | | | Metabolic and Endocrine Issues | 74.25 | <0.001 ** |
| | | | | MSK-Related Conditions | 37.88 | <0.001 ** |
| | | | | Other | 14.87 | <0.001 ** |
| | | | | PTSD and Trauma | 26.05 | <0.001 ** |
| | | | | Respiratory Issues | 29.92 | <0.001 ** |
| MOD Protocol | Depressive and Other Affective Disorders | 29.44 | <0.001 ** | Acute Medical Issues | 12.89 | 0.012 * |
| | | | | Respiratory Issues | 8.16 | 0.043 * |
| | | | | Self-Harm | 11.57 | 0.021 * |
| | | | | Psychosis-Related Disorders | 6.28 | 0.012 * |
| | | | | PTSD and Trauma | 25.53 | <0.001 ** |
| MSK Extremity | Schizophrenia Disorders | 6.49 | 0.011 * | | | |
| | Stress Disorders | 9.13 | 0.003 * | | | |
| | Depressive and Other Affective Disorders | 8.22 | 0.004 * | Acute Medical Issues | 21.81 | <0.001 ** |
| | Drug and Substance Misuse | 7.89 | 0.005 * | Depressive and Other Affective Disorders | 10.11 | 0.006 * |
| Schizophrenia Disorders | 121.06 | <0.001 ** | | Neurodevelopment Disorders | 8.19 | 0.042 * |
| | | | | Other Mental Health Diagnosis | 7.95 | 0.019 * |
| | | | | Personality Disorders | 5.98 | 0.05 * |
| | | | | Respiratory Issues | 11.67 | 0.009 * |

Table 7. Cont.

| Referral Reason | Primary Diagnosis | Chi-Square Correlation (χ^2) | p-Value | Comorbidities | Chi-Square Correlation (χ^2) | p-Value |
|---------------------------|---|-------------------------------------|-----------|---|-------------------------------------|-----------|
| MSK Multiple/Other | Schizoaffective Disorders | 16.99 | <0.001 ** | Pain | 8.06 | 0.018 * |
| | | | | Personality Disorders | 11.56 | 0.003 * |
| | | | | Respiratory Issues | 10.58 | 0.014 * |
| MSK Spine | Eating Disorders | 4.21 | 0.04 * | Anxiety Disorders | 7.60 | 0.022 * |
| | | | | Psychosis-Related Disorders | 5.24 | 0.022 * |
| | Somatoform-Related Disorders | 12.95 | <0.001 ** | Metabolic and Endocrine Issues | 19.36 | <0.001 ** |
| | | | | MSK-Related Conditions | 60.95 | <0.001 ** |
| | | | | Neurological Issues | 12.00 | 0.002 * |
| Neurological | Organic and Neurodegenerative Disorders | 23.21 | <0.001 ** | Obsessive–Compulsive or Hypochondriacal Disorders | 11.04 | 0.004 * |
| | | | | Pain | 20.61 | <0.001 ** |
| Orthopedic or Trauma | Neurodevelopmental Disorders | 3.89 | 0.048 * | MSK-Related Conditions | 7.81 | 0.05 * |
| | | | | Schizophrenia Disorders | 5.35 | 0.021 * |
| Other Reason for Referral | Schizoaffective Disorders | 7.72 | 0.005 * | Neurological Issues | 113.09 | <0.001 ** |
| | | | | Organic and Neurodegenerative Disorders | 31.86 | <0.001 ** |
| | | | | Dermatological Issues | 29.81 | <0.001 ** |
| | | | | MSK-Related Conditions | 11.55 | 0.009 * |
| | | | | Other Personality Disorders | 38.53 | <0.001 ** |
| Respiratory | Eating Disorders | 20.99 | <0.001 ** | Schizoaffective Disorders | 6.74 | 0.034 * |
| | | | | Self-Harm | 18.56 | <0.001 ** |
| Other Reason for Referral | Schizoaffective Disorders | 7.72 | 0.005 * | Sensory Dysfunction | 29.83 | <0.001 ** |
| | | | | Lymphatic, Rheumatic, and Immunological Issues | 16.33 | <0.001 ** |
| | | | | Sensory Dysfunction | 14.70 | <0.001 ** |
| Respiratory | Eating Disorders | 20.99 | <0.001 ** | Depressive and Other Affective Disorders | 7.98 | 0.019 * |
| | | | | Lymphatic, Rheumatic, and Immunological Issues | 52.88 | <0.001 ** |
| | | | | Neurodevelopment Disorders | 13.09 | 0.004 * |
| | | | | Neurological Issues | 194.91 | <0.001 ** |

MSK = Musculoskeletal; PTSD = post-traumatic stress disorder; * significant when $p < 0.05$. ** $p < 0.001$.

3.6. Likelihood of Referral to Physiotherapy by Primary Diagnosis and Comorbidities

Unadjusted binary logistic regression examined the association between primary diagnoses and the likelihood of a person receiving a referral to physiotherapy services. People with eating disorders had 1.60-fold increased odds (95% CI: 0.70–3.65) of being referred to physiotherapy, schizophrenia had 1.61-fold increased odds of being referred (95% CI: 0.75–3.43), obsessive–compulsive and hypochondriacal conditions had 1.98-fold increased odds of being referred (95% CI: 0.40–9.77), organic and neurodegenerative conditions were at 2.40-fold increased odds (95% CI: 0.76–7.60), and somatoform conditions had 3.30-fold increased odds of being referred to physiotherapy (95% CI: 0.57–18.99). However, none were statistically significant.

Similarly, unadjusted binary logistic regression examined the association between physical health comorbid diagnoses and the likelihood of a person being referred to physiotherapy. People presenting with fatigue as a comorbid condition were at 6.38-fold increased odds of receiving a physiotherapy referral (CI: 1.41–28.94, $p = 0.016$), and people with musculoskeletal-related conditions were at 3.48-fold increased odds (CI: 1.23–9.81, $p = 0.019$) of receiving a physiotherapy referral.

4. Discussion

This study highlights the prevalence of multimorbidity in patients admitted to inpatient mental health services and examines patterns of physiotherapy referral based on primary and comorbid diagnoses. By doing so, the current study aims to provide insight

into the role of physiotherapists within inpatient mental health services, identify gaps in referrals, and advocate for the better integration of physiotherapy services. The findings are intended to serve as a blueprint for budget holders, policy makers, and other health professionals proposing or establishing a physiotherapy service within inpatient adult mental health settings. Despite physiotherapists having the potential to enhance the identification and treatment of physical health issues [18,21], recent literature indicates a limited understanding of the physiotherapists' role in mental health among multidisciplinary teams and service providers [22,23]. This analysis seeks to raise awareness of the value of physiotherapy, promote existing services, and support the development of new ones where necessary.

The finding that 58.1% of admissions involved two or more physical health comorbidities aligns with evidence of high physical co-morbidity in individuals with SMI, underscoring the complexity of patient presentations within this setting [24]. This figure is greater than the prevalence of 25% reported within a recent systematic review and meta-analysis [25]; however, the meta-analysis does not provide a direct comparison to inpatient populations. Furthermore, our data may demonstrate the above-average level of health inequality experienced in this area of the UK [26]. While individuals referred to physiotherapy had more comorbidities than those not referred, many with multiple comorbidities still did not receive referrals.

Barriers to optimized referral pathways, such as insufficient integration of physiotherapists within mental health multidisciplinary teams, suggest missed opportunities to address physical health issues [23]. Additionally, patient experience research highlights insufficient attention to physical health in mental health settings [27], further limiting referrals to physiotherapy. This is concerning, as it reflects systematic barriers to physiotherapy, despite service availability. These specific barriers may include limited staff and patient awareness of the benefits of physiotherapy, leading to underutilization and resource constraints like staffing shortages that restrict the identification of need and subsequent referral to physiotherapy services. Stigma surrounding SMI may deter patients from seeking physiotherapy, while communication gaps among healthcare providers is likely to hinder effective referrals, resulting in missed opportunities for improving patient outcomes.

The most common physical comorbidities identified—acute medical issues, metabolic and endocrine disorders, and gastrointestinal conditions—align with previous research [28,29], confirming the representativeness of our sample. Patients presenting with fatigue, schizoaffective disorders, neurological complaints, and musculoskeletal conditions had the highest likelihood of referral to physiotherapy, reflecting staff recognition of the benefits of physiotherapy in these areas [30–33]. Musculoskeletal, neurological, and cardiorespiratory medicine are core practice areas for physiotherapists in the UK [34], making it encouraging that patients with neurological and musculoskeletal symptoms are amongst the most likely to be referred. On the other hand, only 40.4% of patients with musculoskeletal conditions, 41.7% with neurological conditions, and 30.0% of respiratory patients were referred to physiotherapy, highlighting missed opportunities for intervention and the need for staff education to broaden awareness of physiotherapy's scope. It is important to highlight that different comorbidities are likely to result in distinct implications for physiotherapy involvement. For example, musculoskeletal conditions may require pain- or mobility-focused interventions [35,36], while neurological issues may require tailored approaches to manage functional impairments [37].

Mobility concerns as a single indication accounted for the largest proportion of physiotherapy referrals (24.8%), suggesting a significant level of frailty within the patient population, despite the service being designed for working-age adults (aged 18–66). This aligns with evidence that people with SMI have a higher frailty prevalence compared to

the general population [38]. Combined musculoskeletal issues comprised 41.3% of referrals, likely reflecting greater familiarity among staff with this aspect of physiotherapy in working-age adults.

Despite physiotherapists' capacity to promote lifestyle interventions such as physical activity, which positively affect both mental and physical health [39], referrals for lifestyle advice account for less than 5% of referrals. This indicates underutilization of physiotherapists in promoting health-enhancing behaviors. Effective health promotion, as advocated by the Lancet Psychiatry Commission [3], could reduce the future burden of disease on individuals and improve patient outcomes.

It is particularly concerning that, despite 33% of individuals with SMI experiencing chronic pain [40], only one referral was specifically for pain management. Non-pharmacological interventions should be prioritized in pain management [41], yet current referral practices reveal a disconnect between service availability and utilization. Given the complex relationship between chronic pain and mental health, physiotherapists should be integrated into the diagnostic and management processes, reducing the reliance on medication and addressing chronic pain more holistically [42].

A remarkable observation was that our data suggested a potential correlation between increased physical health comorbidities and longer inpatient stays. Longer stays may provide opportunities for physical health issues to be identified, increasing the likelihood of physiotherapy referrals. Patients referred to physiotherapy had an average stay of 117 days, compared to 44 days for patients not referred. However, the average physiotherapy involvement of 27 days suggests that while physiotherapy is often initiated, referrals are delayed by an average of 91 days. Early identification and referral to physiotherapy are crucial for optimizing patient outcomes, and strategies for earlier referrals could benefit more patients.

Statistically significant relationships were identified between referral reasons and primary or comorbid diagnoses. For example, the association between schizophrenia and musculoskeletal injury aligns with evidence of lower bone mineral density [43], insufficient care for osteoporosis [44], and a higher risk for frailty and falls [45]. Additionally, the relationships between a patient referred on a MOD protocol and a primary diagnosis of depressive disorders or PTSD are supported by many studies, demonstrating a higher prevalence of both diagnoses in active or veteran military populations [46–50].

4.1. Limitations and Future Research

Whilst efforts were made to minimize limitations, reliance on clinical data from a single service reduces the generalizability of the findings to other settings. The absence of pre-/post-physiotherapy outcome data limits the ability to assess intervention effectiveness. Variability in the data reflects the diverse physical health needs of individuals with SMI, complicating the identification of clear patterns. Finally, reliance on referral data may not fully capture the demand for physiotherapy services, due to clinician biases or resource constraints.

Despite these limitations, this study provides the first comprehensive exploration of routinely collected data in inpatient mental health physiotherapy services. The findings offer valuable insights for improving service delivery and guiding future service development.

4.2. Recommendations

Inpatient admissions present an opportunity to address physical health comorbidities of individuals with SMI who are disproportionately affected by these issues [51,52] yet are less likely to engage with physical healthcare providers to address these issues [53]. By improving access to physiotherapy services during inpatient stays and providing post-discharge guidance,

patients' engagement with physical healthcare can be enhanced [23,27,54]. Without inpatient referrals, disparities in healthcare access may persist.

To optimize physiotherapy services within mental health settings, we suggest that healthcare providers and policymakers prioritize staff training on physiotherapy and the benefits of addressing physical health comorbidities. This should help to promote the early identification of issues, which should then be addressed via clear referral pathways and adequately resourced physiotherapy services integrated within multi-disciplinary teams. Within patient interactions, physiotherapists should incorporate lifestyle advice to address health inequalities and enhance care quality. Additionally, we recommend ongoing research to evaluate the long-term impacts of physiotherapy on physical and mental health outcomes. These recommendations aim to provide a practical framework for improving physiotherapy integration, ultimately benefiting individuals with SMI.

5. Conclusions

This study provides the first comprehensive exploration of physiotherapy referrals within inpatient mental health settings, offering practical insights for clinicians and administrators. The findings underscore the importance of timely physiotherapy referral and intervention in addressing the interplay between physical and mental health, improving patient outcomes, and reducing healthcare disparities. Future research building on these findings will be essential for refining care models and advancing physiotherapy's role in mental health services.

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Data Availability Statement: The raw data supporting the conclusions of this article will be made available by the authors upon request.

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Appendix A

Table A1. List of grouped primary diagnoses and comorbidities.

| Grouped Diagnoses and Comorbidities |
|---|
| Acute medical issues |
| Anxiety disorders |
| Bipolar disorders |
| Cancer |
| Cardiovascular conditions |
| Depressive and other affective disorders |
| Dermatology issues |
| Drug and substance use/misuse |
| Eating disorders |
| Fatigue syndrome |
| Gastrointestinal conditions |
| Lymphatic, rheumatic, and immunological disorders |
| Metabolic and endocrine disorders |
| Musculoskeletal (MSK)-related conditions |
| Neurodevelopmental disorders |
| Neurological disorders |
| Obsessive–compulsive or hypochondriacal problems |
| Organic and neurodegenerative disorders |
| Other mental health diagnosis |
| Other non-mental health diagnosis |
| Pain |
| Personality disorders |
| Psychosis-related disorders |
| Post-traumatic stress disorder (PTSD) and trauma |
| Reproductive conditions |
| Respiratory disorders |
| Schizoaffective disorders |
| Schizophrenia disorders |
| Self-harm |
| Sensory dysfunction |
| Somatoform-related disorders |
| Stress disorders |

References

1. Stevenson, C.; Choi, C.; Bhatia, K.; Hargreaves, J.; de Looper, M.; Moon, L.; Tallis, K.; Cooper-Stanbury, M. Australia's Health 2006: The Tenth Biennial Report of the Australian Institute of Health and Welfare, Australian Institute of Health and Welfare, Australian Government. Available online: <https://www.aihw.gov.au/getmedia/4451ca32-9168-44a7-8bb9-9e7f0715e4db/ah06.pdf?v=20230605163951&inline=true> (accessed on 16 December 2024).
2. Alexandratos, K.; Barnett, F.; Thomas, Y. The Impact of Exercise on the Mental Health and Quality of Life of People with Severe Mental Illness: A Critical Review. *Br. J. Occup. Ther.* **2012**, *75*, 48–60. [CrossRef]
3. Firth, J.; Siddiqi, N.; Koyanagi, A.; Siskind, D.; Rosenbaum, S.; Galletly, C.; Allan, S.; Canejo, C.; Carney, R.; Carvalho, A.F.; et al. The Lancet Psychiatry Commission: A blueprint for protecting physical health in people with mental illness. *Lancet Psychiatry* **2019**, *6*, 675–712. [CrossRef] [PubMed]
4. Naylor, C.; Das, P.; Ross, S.; Honeyman, M.; Thompson, J.; Gilbert, H. Bringing together physical and mental health. *King's Fund* **2016**, *109*, 364–366.
5. Barnett, K.; Mercer, S.W.; Norbury, M.; Watt, G.; Wyke, S.; Guthrie, B. Epidemiology of multimorbidity and implications for health care, research, and medical education: A cross-sectional study. *Lancet* **2012**, *380*, 37–43. [CrossRef]
6. Jones, D.R.; Macias, C.; Barreira, P.J.; Fisher, W.H.; Hargreaves, W.A.; Harding, C.M. Prevalence, severity, and co-occurrence of chronic physical health problems of persons with serious mental illness. *Psychiatr. Serv.* **2004**, *55*, 1250–1257. [CrossRef]
7. Brown, S.; Kim, M.; Mitchell, C.; Inskip, H. Twenty-five year mortality of a community cohort with schizophrenia. *Br. J. Psychiatry* **2010**, *196*, 116–121. [CrossRef]
8. Academy of Medical Royal Colleges, Improving the Physical Health of Adults with Severe Mental Illness: Essential Actions. 2016. Available online: <https://www.medbox.org/pdf/5e148832db60a2044c2d55ef> (accessed on 16 December 2024).

9. Ride, J.; Kasteridis, P.; Gutacker, N.; Aragon Aragon, M.J.; Jacobs, R. Healthcare Costs for People with Serious Mental Illness in England: An Analysis of Costs Across Primary Care, Hospital Care, and Specialist Mental Healthcare. *Appl. Health Econ. Health Policy* **2020**, *18*, 177–188. [[CrossRef](#)]
10. Wang, H.L.; Han, L.; Jacobs, R.; Doran, T.; Holt, R.I.G.; Prady, S.L.; Gilbody, S.; Shiers, D.; Alderson, S.; Hewitt, C.; et al. Healthcare resource use and costs for people with type 2 diabetes mellitus with and without severe mental illness in England: Longitudinal matched-cohort study using the Clinical Practice Research Datalink. *Br. J. Psychiatry* **2022**, *221*, 402–409. [[CrossRef](#)]
11. Faulkner, G.E.; Gorczynski, P.F.; Cohn, T.A. Psychiatric illness and obesity: Recognizing the „obesogenic“ nature of an inpatient psychiatric setting. *Psychiatr. Serv.* **2009**, *60*, 538–541. [[CrossRef](#)]
12. Hargreaves, J.; Lucock, M.; Rodriguez, A. From inactivity to becoming physically active: The experiences of behaviour change in people with serious mental illness. *Ment. Health Phys. Act.* **2017**, *13*, 83–93. [[CrossRef](#)]
13. Rogers, E.; Papatomas, A.; Kinnafick, F.-E. Inpatient perspectives on physical activity in a secure mental health setting. *Psychol. Sport. Exerc.* **2021**, *52*, 101827. [[CrossRef](#)]
14. Naslund, J.A.; Whiteman, K.L.; McHugo, G.J.; Aschbrenner, K.A.; Marsch, L.A.; Bartels, S.J. Lifestyle interventions for weight loss among overweight and obese adults with serious mental illness: A systematic review and meta-analysis. *Gen. Hosp. Psychiatry* **2017**, *47*, 83–102. [[CrossRef](#)] [[PubMed](#)]
15. Shoosmith, E.; Huddleston, L.; Pervin, J.; Shahab, L.; Coventry, P.; Coleman, T.; Lorencatto, F.; Gilbody, S.; Leahy, M.; Horspool, M.; et al. Promoting and Maintaining Changes in Smoking Behavior for Patients Following Discharge from a Smoke-free Mental Health Inpatient Stay: Development of a Complex Intervention Using the Behavior Change Wheel. *Nicotine Tob. Res.* **2022**, *25*, 729–737. [[CrossRef](#)] [[PubMed](#)]
16. Kandola, A.A.; Osborn, D.P.J. Physical activity as an intervention in severe mental illness. *BJPsych Adv.* **2022**, *28*, 112–121. [[CrossRef](#)]
17. Probst, M. Physiotherapy and Mental Health. In *Clinical Physical Therapy*; IntechOpen: Rijeka, The Republic of Croatia, 2017; Volume 230, pp. 59–68.
18. Stubbs, B.; Soundy, A.; Probst, M.; De Hert, M.; De Herdt, A.; Vancampfort, D. Understanding the role of physiotherapists in schizophrenia: An international perspective from members of the International Organisation of Physical Therapists in Mental Health (IOPTMH). *J. Ment. Health* **2014**, *23*, 125–129. [[CrossRef](#)]
19. Pope, C. Recovering mind and body: A framework for the role of physiotherapy in mental health and well-being. *J. Public. Ment. Health* **2009**, *8*, 36–39. [[CrossRef](#)]
20. Heywood, S.E.; Connaughton, J.; Kinsella, R.; Black, S.; Bicchi, N.; Setchell, J. Physical Therapy and Mental Health: A Scoping Review. *Phys. Ther.* **2022**, *102*, pzac102. [[CrossRef](#)]
21. Soundy, A.; Freeman, P.; Stubbs, B.; Probst, M.; Vancampfort, D. The value of social support to encourage people with schizophrenia to engage in physical activity: An international insight from specialist mental health physiotherapists. *J. Ment. Health* **2014**, *23*, 256–260. [[CrossRef](#)]
22. Andrew, E.; Briffa, K.; Waters, F.; Lee, S.; Fary, R. Physiotherapists' views about providing physiotherapy services to people with severe and persistent mental illness: A mixed methods study. *J. Physiother.* **2019**, *65*, 222–229. [[CrossRef](#)]
23. Lee, S.; Waters, F.; Briffa, K.; Fary, R.E. Limited interface between physiotherapy primary care and people with severe mental illness: A qualitative study. *J. Physiother.* **2017**, *63*, 168–174. [[CrossRef](#)]
24. Goldman, M.L.; Mangurian, C.; Corbeil, T.; Wall, M.M.; Tang, F.; Haselden, M.; Essock, S.M.; Frimpong, E.; Mascayano, F.; Radigan, M.; et al. Medical comorbid diagnoses among adult psychiatric inpatients. *Gen. Hosp. Psychiatry* **2020**, *66*, 16–23. [[CrossRef](#)] [[PubMed](#)]
25. Halstead, S.; Cao, C.; Høgnason Mohr, G.; Ebdrup, B.H.; Pillinger, T.; McCutcheon, R.A.; Firth, J.; Siskind, D.; Warren, N. Prevalence of multimorbidity in people with and without severe mental illness: A systematic review and meta-analysis. *Lancet Psychiatry* **2024**, *11*, 431–442. [[CrossRef](#)] [[PubMed](#)]
26. Corris, V.; Dormer, E.; Brown, A.; Whitty, P.; Collingwood, P.; Bamba, C.; Newton, J.L. Health inequalities are worsening in the North East of England. *Br. Med. Bull.* **2020**, *134*, 63–72. [[CrossRef](#)] [[PubMed](#)]
27. Hemmings, L.; Soundy, A. Experiences of physiotherapy in mental health: An interpretative phenomenological analysis of barriers and facilitators to care. *Physiotherapy* **2020**, *109*, 94–101. [[CrossRef](#)]
28. Wienand, D.; Wijnen, L.I.; Heilig, D.; Wippel, C.; Arango, C.; Knudsen, G.M.; Goodwin, G.M.; Simon, J. Comorbid physical health burden of serious mental health disorders in 32 European countries. *BMJ Ment. Health* **2024**, *27*, e301021. [[CrossRef](#)]
29. Park, S.; Kim, G.U.; Kim, H. Physical Comorbidity According to Diagnoses and Sex among Psychiatric Inpatients in South Korea. *Int. J. Environ. Res. Public Health* **2021**, *18*, 4187. [[CrossRef](#)]
30. Chan, S.; Clough, A. A critical evaluation of evidence-based practice of physiotherapy in musculoskeletal medicine. *Int. Musculoskelet. Med.* **2010**, *32*, 163–166. [[CrossRef](#)]
31. Moseley, A.; Sherrington, C.; Herbert, R.; Maher, C. The Extent and Quality of Evidence in Neurological Physiotherapy: An Analysis of the Physiotherapy Evidence Database (PEDro). *Brain Impair.* **2000**, *1*, 130–140. [[CrossRef](#)]

32. Vera-Garcia, E.; Mayoral-Cleries, F.; Vancampfort, D.; Stubbs, B.; Cuesta-Vargas, A.I. A systematic review of the benefits of physical therapy within a multidisciplinary care approach for people with schizophrenia: An update. *Psychiatry Res.* **2015**, *229*, 828–839. [CrossRef]
33. Wormgoor, M.E.A.; Rodenburg, S.C. The evidence base for physiotherapy in myalgic encephalomyelitis/chronic fatigue syndrome when considering post-exertional malaise: A systematic review and narrative synthesis. *J. Transl. Med.* **2021**, *19*, 1. [CrossRef]
34. Health and Care Professions Council. Standards of Proficiency Physiotherapists Online 2023 [20/08/2024]. Available online: <https://www.hcpc-uk.org/globalassets/resources/standards/standards-of-proficiency---physiotherapists.pdf> (accessed on 16 December 2024).
35. El-Tallawy, S.N.; Nalamasu, R.; Salem, G.I.; LeQuang, J.A.; Pergolizzi, J.V.; Christo, P.J. Management of musculoskeletal pain: An update with emphasis on chronic musculoskeletal pain. *Pain Ther.* **2021**, *10*, 181–209. [CrossRef] [PubMed]
36. O'Connor, S.R.; Tully, M.A.; Ryan, B.; Bleakley, C.M.; Baxter, G.D.; Bradley, J.M.; McDonough, S.M. Walking exercise for chronic musculoskeletal pain: Systematic review and meta-analysis. *Arch. Phys. Med. Rehabil.* **2015**, *96*, 724–734. [CrossRef] [PubMed]
37. Misri, Z. *Physiotherapy for Adult Neurological Conditions*; Joshua, A.M., Ed.; Springer: Singapore, 2022.
38. Warren, N.; Leske, S.; Arnautovska, U.; Northwood, K.; Kisely, S.; Siskind, D. Prevalence of frailty in severe mental illness: Findings from the UK Biobank. *BJPsych Open* **2023**, *9*, e185. [CrossRef] [PubMed]
39. Stubbs, B.; Vancampfort, D.; Hallgren, M.; Firth, J.; Veronese, N.; Solmi, M.; Brand, S.; Cordes, J.; Malchow, B.; Gerber, M.; et al. EPA guidance on physical activity as a treatment for severe mental illness: A meta-review of the evidence and Position Statement from the European Psychiatric Association (EPA), supported by the International Organization of Physical Therapists in Mental Health (IOPTMH). *Eur. Psychiatry* **2018**, *54*, 124–144. [CrossRef]
40. Stubbs, B.; Mitchell, A.J.; De Hert, M.; Correll, C.U.; Soundy, A.; Stroobants, M.; Vancampfort, D. The prevalence and moderators of clinical pain in people with schizophrenia: A systematic review and large scale meta-analysis. *Schizophr. Res.* **2014**, *160*, 1–8. [CrossRef]
41. Ma, R.; Romano, E.; Ashworth, M.; Smith, T.O.; Vancampfort, D.; Scott, W.; Gaughran, F.; Stewart, R.; Stubbs, B. The Effectiveness of Interventions for Improving Chronic Pain Symptoms Among People With Mental Illness: A Systematic Review. *J. Pain.* **2024**, *25*, 104421. [CrossRef]
42. The, L. Rethinking chronic pain. *Lancet* **2021**, *397*, 2023. [CrossRef]
43. Leucht, S.; Burkard, T.; Henderson, J.; Maj, M.; Sartorius, N. Physical illness and schizophrenia: A review of the literature. *Acta Psychiatr. Scand.* **2007**, *116*, 317–333. [CrossRef]
44. Bishop, J.R.; Alexander, B.; Lund, B.C.; Klepser, T.B. Osteoporosis screening and treatment in women with schizophrenia: A controlled study. *Pharmacotherapy* **2004**, *24*, 515–521. [CrossRef]
45. Stubbs, B.; Mueller, C.; Gaughran, F.; Lally, J.; Vancampfort, D.; Lamb, S.E.; Koyanagi, A.; Sharma, S.; Stewart, R.; Perera, G. Predictors of falls and fractures leading to hospitalization in people with schizophrenia spectrum disorder: A large representative cohort study. *Schizophr. Res.* **2018**, *201*, 70–78. [CrossRef]
46. Schaller, E.K.; Woodall, K.A.; Lemus, H.; Proctor, S.P.; Russell, D.W.; Crum-Cianflone, N.F. A Longitudinal Comparison of Posttraumatic Stress Disorder and Depression Among Military Service Components. *Mil. Psychol.* **2014**, *26*, 77–87. [CrossRef]
47. Moring, J.C.; Nason, E.; Hale, W.J.; Wachen, J.S.; Dondanville, K.A.; Straud, C.; Moore, B.A.; Mintz, J.; Litz, B.T.; Yarvis, J.S.; et al. Conceptualizing comorbid PTSD and depression among treatment-seeking, active duty military service members. *J. Affect. Disord.* **2019**, *256*, 541–549. [CrossRef] [PubMed]
48. Arenson, M.B.; Whooley, M.A.; Neylan, T.C.; Maguen, S.; Metzler, T.J.; Cohen, B.E. Posttraumatic stress disorder, depression, and suicidal ideation in veterans: Results from the mind your heart study. *Psychiatry Res.* **2018**, *265*, 224–230. [CrossRef] [PubMed]
49. Miskey, H.M.; Shura, R.D. Association of Self-Report Measures with PTSD and Depression in Veterans. *Curr. Treat. Options Psychiatry* **2017**, *4*, 254–261. [CrossRef]
50. Sher, L.; Braquehais, M.D.; Casas, M. Posttraumatic stress disorder, depression, and suicide in veterans. *Cleve Clin. J. Med.* **2012**, *79*, 92–97. [CrossRef]
51. Lauwers, N.; Dotsikas, K.; Marston, L.; Price, G.; Osborn, D.P.J.; Hayes, J.F. The impact of comorbid severe mental illness and common chronic physical health conditions on hospitalisation: A systematic review and meta-analysis. *PLoS ONE* **2022**, *17*, e0272498. [CrossRef]
52. Pizzol, D.; Trott, M.; Butler, L.; Barnett, Y.; Ford, T.; Neufeld, S.A.; Ragnhildstveit, A.; Parris, C.N.; Underwood, B.R.; López Sánchez, G.F.; et al. Relationship between severe mental illness and physical multimorbidity: A meta-analysis and call for action. *BMJ Ment. Health* **2023**, *26*, e300870. [CrossRef]

53. Melamed, O.C.; Fernando, I.; Soklaridis, S.; Hahn, M.K.; LeMessurier, K.W.; Taylor, V.H. Understanding Engagement with a Physical Health Service: A Qualitative Study of Patients with Severe Mental Illness. *Can. J. Psychiatry* **2019**, *64*, 872–880. [[CrossRef](#)]
54. Hodgson, P.; Haywood, J.; Benham, A. Physical activity following discharge from inpatient adult mental health settings. *Ment. Health Phys. Act.* **2024**, *26*, 100574. [[CrossRef](#)]

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