

## تأثير الرياضة على الاعراض الموجبة والسالبة لدى مرضى الفصام

### في مستشفى الرشاد للأمراض العقلية

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### الملخص

الفصام من الاضطرابات العقلية المزمنة، ويتوفر العديد من الطرق العلاجية له مثل العلاج الدوائي والعلاج النفسي، لكن هذه الانواع من العلاجات لها تأثير محدد على المرضى المصابين به. لذلك قد يكون اضافة العلاج بالرياضة هو السبيل الى تطوير الصحة العقلية لدى هؤلاء المرضى.

يهدف البحث الى دراسة التأثير العلاجي للرياضة على الاعراض الموجبة والسالبة لدى المرضى المصابين بالفصام.

وقد تم اجراء هذا البحث في مستشفى الرشاد التدريبي في مدينة بغداد واستغرق العمل فيه ٦ اشهر. تم اختيار ١٠٠ مريض يصوره عشوائية كانت اعمارهم تتراوح بين ١٨-٥٩ سنة ويعانون من مرض الفصام المشخص حسب الدليل التشخيصي والاحصائي للاضطرابات النفسية (DSM-5) لمدة سنتين على الاقل قبل بدء الدراسة، وتضمن البرنامج اجراء حصص تدريب ومباريات تنافسية مرتان في الاسبوع وتم اختيار العاب رياضية جماعية مثل كرة القدم وكرة السلة.

اظهر البحث ان الاعراض الموجبة والسالبة حسب المقياس العالمي (PANSS) قد انخفضت لدى مجموعة المرضى الذين شاركوا في البحث، وتحسنت الفعالية النفسية والاجتماعية لديهم ايضا.

وعليه فان المشاركة في الالعاب الرياضية قد يقلل من الاعراض المرضية للفصام و يقلل كذلك فرص حدوث انتكاسات مرضية مما يؤدي بالنتيجة الى تقليل استخدام المضادات الذهانية.

**الكلمات المفتاحية:** (مرض الفصام، مزمن، العلاج الرياضي الطبيعي)

### Effect of Sport Intervention on Positive and Negative Symptoms in Schizophrenic Patient at AL-Rashad Mental hospital

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### Abstract

Schizophrenia, is a chronic mental disorder. The treatment strategies include medication and many types of psychotherapy, but these can have limited effects in the most affected patients. Sport therapy may provide a mean of improving mental health among people with schizophrenia. The aim of this study is to examine the effect of sport intervention on the Positive and Negative Symptom Scale (PANSS) of the inpatients diagnosed with schizophrenia.

Subjects and methods of study was conducted at AL Rashad Hospital in the city of Baghdad for 6 months. It is a single blind randomized controlled trial. 100 male patients between the age of 18-59 years with a diagnosis of schizophrenia according to DSM-5 criteria for at least 2 years duration prior to the beginning of the study were randomly included. The study group underwent training sessions followed by competitions in games need interaction . Results show that total PANSS scores for the study group were significantly lower than those for the controls group, comparisons also showed that sport intervention affords significant advantages on general psychosocial functioning .Conclusions participation in sport may reduce the psychiatric symptoms in patients with chronic schizophrenia, less relapse and less consuming of different antipsychotic medications.

**Keywords:** (Schizophrenia, Physical Activity, Sport, Psychosocial Rehabilitation).

## 1- Introduction and Importance of Research

Sport psychology is an interdisciplinary field, draws on knowledge from many interacting fields including psychology, physiology, biomechanics and kinesiology. It involves the study of how psychological factors affect performance and how participation in sport and exercise affect psychological and physical factors.(1) The birth of sports psychology in Europe happened in Germany, in the early 1920s the first sport psychology laboratory was founded by Dr. Carl Diem in Berlin,(2) Exercise psychology research's increased in the 1950s and 1960s, leading to several presentations at the second gathering of the International Society of Sport Psychology in 1968.(3) William Morgan during 1970s and 1980s, wrote about the relationship between exercise and mood,(4) anxiety,(5) and adherence to exercise programs.(6)

The benefits of physical activity and exercise on health are well documented, which could help people with schizophrenia. Evidence suggests that besides mental health and physical well-being, sport practice can improve general the cognitive abilities(7) in mentally ill and healthy individual . (8)

Schizophrenia is classified as one of the psychiatric disorders, traditionally called the functional psychosis. symptoms of schizophrenia are divided to:

- Positive symptoms(new symptoms or signs) Delusions, hallucinations and formal thought disorder .
- Negative symptoms (loss of a previous function)Loss of the normal level of motivation and drive, loss of awareness of behavior, flattening of mood, and difficulty in abstract thinking.

But there are a lot of effective interventions which may help individuals to lead more normal lives. Current researches were directed towards the causes of schizophrenia and investigating the possibility of early interventions in those identified at high risk for the disorder or with prodromal symptoms (possible early signs of the disorder)(9).

People with schizophrenia are more likely to be heavy smoker (10), physically inactive (11), suffer from malnutrition due to an unhealthy diet (12)and have low cardiorespiratory fitness (CRF) (13,14,15).

They suffer from comorbid psychiatric disorders such as depression and substance misuse (16) and complain of multiple somatic comorbidities (17).

Decrease physical activity has been described as the leading risk factor for global mortality (18) The World Health Organization (WHO) 2009 reported that physical inactivity accounts for 27% of diabetes and 30% of ischemic heart diseases, whereas an active lifestyle reduces these risks, largely improving general health and wellness, and life expectancy(19) .

These problems lead to the appearance of a new groups of patients who are usually young, poor response to the treatment and multiple other problems (smoking , sedentary life ,difficulties in diet controlling , weight gain etc.). Often they display difficulties in accepting a strictly defined and rigorous program that make change in their lifestyle although it could represent an improvement in their quality of life (20).

Therefore, it is time to find a new method to help in treatment of people with schizophrenia which is well tailored, applied and build up to ensure patients compliance and can decrease the negative symptoms, improve the cognitive function and also improves the functional and clinical outcome

The tertiary prevention process for helping the person with a serious mental illness to return to the highest possible level of functioning is Rehabilitation, so in order to reach the optimum results with rehabilitation, all aspects of a schizophrenic's life must be considered. Rehabilitation plan is individualized and is formulated with the help of the person with schizophrenia , his family and all health care providers associated with him. This will help achieve self-assurance and autonomy, and help achieving the most important aspect of rehabilitation which is improving the quality of the schizophrenia sufferer life.

Psychiatric rehabilitation focus on helping individual with schizophrenia to develop skills and access resources needed to increase their skills and capacity to be

successful in their life, working, learning, and social environments of their choice (Adopted by the US Psychiatric Rehabilitation Board September 2007).

In Iraq Al-Rashad Hospital is the biggest hospital for short-and long-term care of mentally ill patients located in the eastern district of Baghdad City since the early 1950s, rehabilitation at Al Rashad Hospital dated back to many decades , most of activities were by the most enthusiastic employees, we try to tailor services to be evidenced based through assessment's tools, statistics, feedback from field worker especially our treating psychiatrists, rehabilitation staff, nursing staff, patients and patients families.(21)

Rehabilitation programs (Al-Rashad Hospital)

- Vocational Rehabilitation
- Social and vocational training.
- vocational counseling.
- Group therapies.
- Music therapies.
- Sport Therapies.
- Psychodrama.
- Family therapies (express emotion).
- Art Therapies.
- Social skills training.
- Recreational Therapies..
- Problem-solving , coping with stress .
- Money management skills.
- Computer & Games (22-23).

Sport are important examples of rehabilitation , physical activity defined as body movement produced by skeletal muscles which require energy expenditure. "Physical Activity" as a term should not be mistaken with "exercise" which is a subcategory of physical activity that is planned, structured, repetitive, and purposeful in with sense that the improvement or maintenance of one or more components of physical fitness is the objective (WHO 2017).

How a sport should be defined includes:

Physical activities including the element of competition (24) , controlled with rules by which participation is governed to ensure fair competition which need: either

- Expression of physical skill (Australian Sports Commission 2014) , Or

-Ability to improve physical fitness and mental well-being (Council of Europe 2001).

Playing a sport is associated with a strong sense of identity, self-confidence, social support and a sense of belonging this will increase the levels of motivation and adherence to sport , physical activities also make them feel less vulnerable to the psychosocial barriers that prevent participation (25). It's considered as a key aspects which promote recovery.

The International Olympic Committee general population highlights many bio-psycho-social benefits of sport participation supported by recent reviews on particular sports which illustrate similar findings supporting the benefit to an individual's bio-psycho-social health (26)

Physical health of mentally ill individuals especially those with schizophrenia is considerably worse if compared to the general population, only a small number of them meet the current recommendations for physical activity which recommend to accumulate at least 150 minutes a week of moderate-intensity physical activity , at the mean time overweight and obesity in individuals with schizophrenia are recommended to increase the time of moderate physical activity to 200-300 minutes a week and use a dietary and behavioral component to enhance weight loss. (27)

Beside all these, sport can improve positive , negative symptoms and the general psychopathology of PANSS scale of the patients during observation of sports-related actions as proved by Takahashi H (30), but further studies for the neurobiological mechanisms underlying the therapeutic effect of sports for individuals with schizophrenia need to be continued.

## 2- Problem of Research

The problem of this research is can sport and exercise affect psychological factors so this study done to show if psychological factors affect performance and how participation in sport and exercise affect psychological and physical factors , this study answer big question can sport therapy made effect on positive and negative symptoms for schizophrenic patient or can sport effect on general psychopathology.

## 3- Aim of Study

- To examine the effect of exercise and sport on positive and negative symptoms for inpatients diagnosed with schizophrenia at Al-RASHAD Hospital\Baghdad.
- To Identify if there is any effect of sport on general psychopathology.

#### 4- Methodology

This Experimental cohort study took place in AL Rashad Mental Hospital in Baghdad which is located in the east of Baghdad and it's the largest Hospital for short and long term services for patients who suffer mental illness in Iraq, 100 patients with schizophrenia were recruited randomly to participate in this study all of them were diagnosed with schizophrenia according to clinical diagnosis depending on criteria of DSM5 (The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5)). We excluded patients with mental retardations and patients with dementia before selecting patients, the study was explained to the patients and consent was taken from them and their responsible psychiatrist to participate, 100 male patients, whose ages ranged from 18 to 59 years, were recruited, for this study patients were divided into two groups randomly , 50 as study group and 50 as control group. The participants are those patients who participated in the program and were on antipsychotic drugs, while the control group included individuals who were on antipsychotic drugs only.

Sessions were considered to be twice weekly for 6 months in the sport room of the rehabilitation unit at Al Rashad Hospital or on the playground inside the Hospital. The attendance rate was fixed although rezones (general health of the patients, Interest , Weather. etc.) were accepted to miss the participation for no more than two sessions.

The study group started scheduled training sessions then playing kinds of games that need interaction of many patients like football , basketball and competitions between them took place , which enhance the patient identity and confidence. Shortage in the sport trainers was the main obstacle in conducting this program.

Assessment undertaken at the start of the study and at the end of it with PANSS scale which is a semi-structured clinical interview , 30-item scale (PANSS-30) which is the most widely used rating scale in schizophrenia, Arabic version of the scales were used for the assessment of positive, negative symptoms and general psychopathology . physical fitness was examined by the responsible physician of the Hospital.

##### 4-1 Statistical Analysis

Data tabulation, input and coding was done by the use of IBM© SPSS© (Statistical Package for the Social Sciences) Statistics Version 22.

For descriptive statistics, percentage were applied, Paired T-tests were used to compare the mean PANSS scores. P-value less than 0.05 were considered significant throughout data analysis.

Also reduction by 20% in mean PANSS scores of age group was considered to be clinical improvement.

## 5- Results

This study included 100 inpatients, all had been assessed by mean of PANSS, at the start of the study and after six months of participation , without exclusion of any patient,50 patient was recruited to the study group and 50 in control group randomly .

There had been a good level of improvement for most of them, some of them show an impressing change in mood , social contact and cooperation with others ,few of them became fit for discharged

In this study; age was distributed into 4 groups, the (18-29) years group had the fewest number of patients in cohort group2 (4%) and control group 3(6%), as for (30-39) years age group had 13(26%) patients in control group and 19 (38%) patients in cohort group. While the (40-49) years age groups had 17 (34%) among cohort and 18(36%) in the control group lastly the (50-59) had 12(24%) in cohort group and 16(32%) in control group .

Among marital status , single patients were predominant as there were 27(54%) single patients in cohort group, and 28 (56%) in control group, only 6(12%) and 4(8%) married patients in study and control groups respectively, while there were 8(16%) separated patients and 2 (4%) in control and cohort group, divorced patients were 6(12%) and 14(28%) among control group and cohort group respectively, in comparison to 4(8%) control to 1(2%) in cohort group among divorced patients lastly The widowed was 4(8%) in the control with 1(2%) in cohort group .As for patients who had children, there were 18(36%) controls had children along with 12 (24%) patients from cohort group. As shown in Table (1) Among level of education there was zero patients in both group had acquired a high graduate degree, while there were 12 (24%) patients reading and writing in control and 13(26%) in the study group, the number completed primary school in control group was 18(36%) with 16(32%) in the study group , and 3(6%) 8(16%) respectively in the control and study group to those with medium education. 11 (22%) patients completed junior high in the control, while among cohort group there were 10(20%) study group .As for institute and college the control was 6(12%) and the study was 3(6%).

Table (1) Social and clinical variables of patients who suffer schizophrenia

Variables	Cases		Controls	
	no	%	no	%
<b>Age</b>				
(18-29) Years	3	6	2	4
(30-39) Years	13	26	19	38
(40-49) Years	18	36	17	34
(50-59) Years	16	32	12	24
<b>Total</b>	<b>50</b>	<b>100</b>	<b>50</b>	<b>100</b>
<b>Marital status</b>				
Single	28	56	27	54
Married	4	8	6	12
Separated	8	16	2	4
Divorced	6	12	14	28
Widowed	4	8	1	2
<b>Total</b>	<b>50</b>	<b>100</b>	<b>50</b>	<b>100</b>
<b>Children</b>				
non	32	64	38	76
1-7	18	36	12	24
<b>Total</b>	<b>50</b>	<b>100</b>	<b>50</b>	<b>100</b>
<b>Level of education</b>				
Read and write	12	24	13	26
Primary	18	36	16	32
medium	3	6	8	16
Junior high	11	22	10	20
Institute ,College	6	12	3	6
High graduate degree	0	0	0	0
<b>Total</b>	<b>50</b>	<b>100</b>	<b>50</b>	<b>100</b>
<b>Employment Status</b>				
Student	0	0	3	6
retired	3	6	4	8
farmer	9	18	11	22
unemployed	18	36	15	30
Professional or semi	2	4	0	0
Skillful workers	1	2	3	6
Unskilled worker	17	34	14	28
<b>Total</b>	<b>50</b>	<b>100</b>	<b>50</b>	<b>100</b>
<b>Monthly income in ID</b>				
Few less than 50.000	43	86	47	94
Medium 50.000-100.000	7	14	3	6
Good more than 100.000	0	0	0	0
<b>Total</b>	<b>50</b>	<b>100</b>	<b>50</b>	<b>100</b>
<b>Family Type</b>				
No family	41	82	41	82
Small	6	12	7	14
Big	3	6	2	4
<b>Total</b>	<b>50</b>	<b>100</b>	<b>50</b>	<b>100</b>
<b>Social relations</b>				
Have social support	9	18	15	30
No social support	41	82	35	70
<b>Total</b>	<b>50</b>	<b>100</b>	<b>50</b>	<b>100</b>
<b>Religion</b>				
Muslim	49	98	50	100
Christian	1	2	0	0
others	0	0	0	0
<b>Total</b>	<b>50</b>	<b>100</b>	<b>50</b>	<b>100</b>
<b>Address</b>				
Urban	30	60	31	62
Sub Urban	14	28	14	28
rural	6	12	5	10
<b>Total</b>	<b>50</b>	<b>100</b>	<b>50</b>	<b>100</b>



Table (2) Outcome of cohort group after sport therapy trial according to age groups

Age groups (in years)	Total number	improved		Not improved		p-value
		No.	%	No.	%	
18-29	3	3	100	0	0	0.169
30-39	13	8	61.5	5	38.5	
40-49	18	15	83.3	3	16.7	
50-59	16	14	87.5	2	13.5	
Total	50	40	80.0	10	20	

Chi-square test was use

Table (3) Main PANSS categories for cohort group before and after sport therapy

PANSS	Sport therapy				P value
	before		after		
	mean	sd	mean	SD	
Positive scale	15.79	8.520	13.21	5.833	0.000
Negative scale	20.18	7.151	12.16	4.088	0.000
General psychopathology scale	35.00	14.347	23.22	7.993	0.000

Table (4) Main PANSS categories for control group before and after trial period

PANSS	Trial period				P value
	before		after		
	mean	SD	mean	SD	
Positive scale	14.54	7.635	15.14	8.398	0.001
Negative scale	17.44	6.855	17.88	7.583	0.17
General psychopathology scale	33.46	13.321	33.72	13.741	0.36

Table (5) Positive symptoms outcomes after sport therapy trial with the study group

Positive symptoms	Sport therapy trial				P-value
	Before		After		
	Mean	SD	Mean	SD	
Delusion	2.90	1.518	2.35	1.137	0.001
Conceptual disorganization	1.30	0.657	1.15	0.366	0.083
Hallucinatory behavior	2.50	1.762	1.75	1.070	0.001
Excitement	1.90	1.165	1.75	0.786	0.267
Grandiosity	1.65	0.9331	1.45	0.826	0.163
Suspicious/ persecution	3.00	1.747	1.95	1.191	0.000
Hostility	1.80	.508	1.50	0.889	0.055

Table (6) Positive symptoms outcomes after trial period in control group

Positive symptoms	Trial period				P-value
	Before		After		
	Mean	SD	mean	SD	
Delusion	3.34	1.649	3.28	1.629	0.182
Conceptual disorganization	1.86	1.195	1.96	1.309	0.024
Hallucinatory behavior	1.98	1.407	2.08	1.496	0.024
Excitement	1.18	0.523	1.32	0.713	0.018
Grandiosity	2.06	1.583	2.18	1.625	0.083
Suspicious/ persecution	2.84	1.683	2.92	1.736	0.044
Hostility	1.28	0.834	1.4	0.904	0.013

Table (7) negative symptoms outcomes after sport therapy trial in cohort group

Negative symptoms	sport therapy trial				p-value
	Before		after		
	Mean	sd	mean	sd	
Blunted affect	3.75	0.786	2.00	0.459	0.000
Emotional withdrawal	3.50	0.827	1.55	0.510	0.000
Poor rapport	2.45	1.099	1.60	0.503	0.001
Passive/ a pathetic social withdrawal	2.85	1.089	1.50	0.513	0.000
Difficulty in abstract thinking	3.50	1.638	2.00	0.513	0.000
Lack of spontaneity and flow of conversation	3.00	0.918	1.80	0.696	0.000
Stereotype	1.80	1.105	1.40	0.503	0.017

Table (8) negative symptoms outcomes after sport therapy trial with in control group

Negative symptoms	sport therapy trial				p-value
	before		after		
	mean	SD	mean	SD	
Blunted affect	3.34	0.772	3.34	0.848	1.00
Emotional withdrawal	2.68	1.151	2.76	1.222	0.044
Poor rapport	1.76	0.981	1.84	1.131	0.044
Passive/ a pathetic social withdrawal	2.44	1.053	2.52	1.165	0.044
Difficulty in abstract thinking	3.12	1.792	3.06	1.776	0.569
Lack of spontaneity and flow of conversation	2.54	1.129	2.64	1.129	0.024
Stereotype	1.56	1.128	1.68	1.203	0.013

Participant in sport therapy show improvements in some positive symptoms more than others, as there was significant statistical relation between sport therapy and reduction in delusion (p-value= 0.001), reduction in hallucinatory behavior (p-value= 0.001), and reduction in suspicious/persecution (p-value= 0.000). While there was no significant statistical relation between participation and reduction in conceptual

disorganization (p-value= 0.267), reduction in excitement (p-value= 0.083), reduction in grandiosity (p-value= 0.055), and reduction in hostility (p-value= 0.163). As shown in Table (5).

Control group has shown no improvement in all positive symptoms, except for delusion in which there was slight reduction in mean scores, but it were all statistically insignificant, as the (p-values) were all  $> 0.05$ . As shown in Table (6).

Participants had shown statistically significant reduction in all negative symptoms, as shown in Table (7), and the greatest reduction in mean score was in emotional withdrawal (55.71%), followed by passive/a pathetic social withdrawal (47.36 %), then blunted affect (46.66%), then lack of spontaneity and flow of conversation (40.0%), then difficulty in abstract thinking (37.14%), poor rapport(34.69%), and the least improvement in mean negative symptom score was in stereotype (22.22%). Table (7)

Control group has shown worsening in some negative symptoms, as there was significant statistical increment in mean scores after the trial period in emotional withdrawal (p-value = 0.044, and mean increment = 2.89%), poor rapport (p-value = 0.044, and mean increment = 2.89%), passive/ a pathetic social withdrawal (p-value = 0.044, and mean increment = 2.89%), lack of spontaneity and flow of conversation (p-value = 0.024, and mean increment = 3.78%), and stereotype (p-value = 0.013, and mean increment = 7.14%). While there was no significant statistical difference after trial period in blunted affect (p-value = 1.0, and mean difference = 0.0%), and difficulty in abstract thinking (p-value = 0.569, and mean reduction = 0.64%) Among employment state, the student was 3(6%) in the study group, those who was retired in the control 3(6%) with 4(8%) in study group, farmers was 9(18%) and 11(22%) in control and study group respectively. there were 13 (26%) and 18 (36%) unemployed patients in control and 15(30%) in cohort group respectively, and there were 17(32%) unskillful workers in control groups and 14(28%) unskillful workers in cohort group, while there was only 1 (2%) skillful worker in control group and 3(6%) skillful workers in cohort group.

This study shows that there was no significant statistical relation between age groups and sport therapy (p-value=0.169  $> 0.05$ ), since all age groups had shown improvements, as there was 3 (100.0%) improved patients in (18-29) years age group, 8 (61.5%) improved patients in (30-39) years age group, 15 (83.3%) in (40-49) years and 14 (87.5%) in (50-59) years age groups, with total of 40 (80.0) improved patients. As shown in Table (2) .

All three categories of PANSS in cohort group had shown significant statistical deference after sport therapy trial ( $p$ -value  $< 0.05$ ), had the greatest reduction in general psychopathological mean score ,followed by negative symptoms score and the least improvement in scores was found in positive scale . As shown in Table (2).While scores of control groups after trial period had shown no improvements, as shown in Table (3) the mean scores increased, but the only significant difference was in positives scale ( $p$ -value= 0.001). Table (8)

## 6- Discussion

This study might be the first in Iraq to investigate the effect of sport and exercise participation among individuals with schizophrenia , the compared studies all were taking places in foreign countries .The results of this study reveal no statistically significant difference in response to sport intervention among different age groups but we found no similar readings in other studies to compare with .

This study had reveal statistically significant improvement in the positive signs and symptoms of schizophrenia disorder in the cohort group this goes with Andrew Soundy in his systematic review (26) , Takahashi H (30) and Giorgio Corretti (28), but Sturludóttir K (29) in his study had shown no significant improvement in positive symptoms . In this study the positive symptoms which improved are delusion and hallucinatory behavior (study group).Negative symptoms had showed significant response in general score, and also its subgroups, in the study group this goes with the results of Sturludóttir K (29) , Takahashi H (30) ,Thomas W. (31) and MeenakshiDauwan (32).The negative symptoms usually found to be difficult to improve and took a long time to get better, that's why the result of this study need to be generalized to speed the improvement of the symptoms in psychotic patients.

This study show statistically significant response in some negative symptoms (statistically significant P-value) in the control group this result could be due to the rehabilitation sessions which every patient in Al-Rashad Hospital enjoys, especially those who were in a stable psychiatric condition. These sessions were arranged to be once weekly for each ward in the hospital .

## 7- Conclusions

The study showed that the participation in sports, at least and in the short term, may result in reductions of both positive and negative symptom. Negative symptoms are

difficult to improve , second generation antipsychotic are known to show improvement in these symptoms but in our study there were statistically significant results in there improvement in the study group after the trail .

Possibly this participation have wider health benefits because the improvement in the psychiatric symptoms will lead to decrease the duration of improvement which lead to decrease duration of institutionalization ,the less institutionalization period the less need for pharmacological treatments( drugs ) , all other psychiatric (psychotherapy and rehabilitation services) and medical services , and not forgetting the reduction in destruction of hospital and personal properties . The coast benefit of such reduction deserve the trial of generalizing the use of sport in our rehabilitation units and encouraging the mentally ill in general and the schizophrenic patients specifically to exercise and having sport session as part of their treatment to help them in improvement and get a better quality of life.

All these will definitely lead to decrease stigma of the mental illness and help the patients to return back to their previous level of social & occupational functioning.

## 8- Recommendations

Further adequately-powered and well-designed studies are needed to confirm the benefits of sport participation in individuals who suffer schizophrenia disorder, taking in mind the effect on BMI(Body mass index) and physical health of schizophrenic patients.

Education of the medical staff and society about the health and coast benefits of exercise as a helpful way to shortening the duration of improvement and institutionalization of the mentally ill patients. Funding the rehabilitation units to maintain the best performance in helping mentally ill patients.

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