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# The Perceived Roles of Exercise and Sports by inpatients of Rehabilitation Therapy at Karin Grech Rehabilitation Hospital (Malta)

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**BACKGROUND:** Exercise forms a crucial part of any rehabilitation program and is a key tool in inpatient therapy. The patients' own perceived roles and benefits of exercise after discharge from hospital is pivotal in determining whether physical activity and exercise are continued within the community. Furthermore, the perception of the role of sports, as a separate entity from exercise, is also unknown, in spite of its several known benefits.

**METHODS:** All patients under 75 years of age, that were admitted for inpatient rehabilitation between 2018 and 2019 to Karin Grech Rehabilitation Hospital (Malta) were invited to participate in a telephone based questionnaire. This questionnaire was aimed at identifying the patients' views related to the roles of exercise and sports in their lives prior to their admission to hospital, and how such views have changed after being discharged from inpatient rehabilitation.

**RESULTS:** Out of 165 patients that were recruited for the study, 93 patients have responded to the telephone based questionnaire. Most participants have reported that they have strongly agreed that exercise has helped in improving their quality of life (QOL) (62%), mental well-being (61%) and social life (52%). Similar results for views related to sports have also been obtained. Post rehabilitation, 65% of patients have stated that they were participating in a form of exercise, compared to 37% before rehab ( $\chi^2 = 42.3$ ,  $p = 0.00$  ( $p < 0.05$ )). The barriers limiting participation in exercise and sports were found to be personal (financial = 61%, lack of time = 47% and dependence on others = 33%) as well as environmental (lack of suitable facilities = 42%, lack of assistance by trained personnel = 36% and lack of accessibility = 33%).

**CONCLUSIONS:** Individuals discharged following inpatient rehabilitation were significantly more prone to be participating in exercise or sports 1 year after discharge. Both personal and environmental barriers have been identified limiting participation. Work is needed in promoting changes in infrastructure that would facilitate participation as well as guidelines aimed at maximising exercise promotion in patients post rehabilitation.

**Keywords:** rehabilitation; exercise; sports; perception; inpatients



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### **Introduction**

Rehabilitation medicine, which can be considered part of the holistic approach to healthcare and wellbeing, is a crucial aspect of the health services provided by any health institution. The aim of rehabilitation services is to enable patients to regain their functionality and minimize the impact of their disability<sup>(1)</sup>. The World Health Organization's (WHO) international classification of functioning, disability, and health (ICF) does not only look at the medical and the clinical aspects of disability, but also includes the social aspects which equally have a great impact on the wellbeing of patients<sup>(2)</sup>.

It is currently estimated that around 2.4 billion people live with a condition that would benefit from a rehabilitation intervention <sup>(1)</sup>. With an ever aging population, unique needs and challenges in rehabilitation management, such as comorbidities, cognitive decline, polypharmacy and end of life care have become more important. As it is well documented, the risk of mortality after an acute hospital inpatient stay increases. <sup>(3)</sup> Therefore, specific rehabilitation programs may not only improve the outcomes but also reduce hospital and care home readmissions <sup>(4)</sup>. A meta-analysis by Bachman and finger *et al* (2010) have shown that the intervention of a rehabilitation program specifically aimed at geriatric populations, had an overall beneficial effect in reducing mortality, improving function and reducing admissions compared to the usual care practices.

The need for physical activity and exercise is becoming more prominent, especially in rehabilitation programs where interventions include either one or the other, and sometimes both interventions <sup>(5)</sup>. Although physical activity is usually confused with exercise, both are distinct. Physical activity is defined as the movement of muscles that produces the expenditure of energy and this can take up various forms<sup>(5)</sup>. Exercise on the other hand, can be considered as a sub-type of physical activity which sets planned, repetitive and structured goals that are aimed towards improving or maintaining physical fitness. Physical inactivity is a major cause ( 6–10%) of non-communicable diseases and unhealthy behaviours, resulting in 9% of premature mortality<sup>(6)</sup>.

The inclusion of sport in rehabilitation programs is becoming more popular. It is estimated that approximately two-thirds of adult populations partake in sports. Nevertheless, only one-third of individuals with a disability participate regularly in sports <sup>(11,12)</sup>. In one particular study, it was noted



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that although sports is part of rehabilitation programs in the Netherlands, only a few patients continue partaking in sports once their program is over<sup>(13)</sup>. A systematic review looked into the main barriers to sports participation, which have included the perceived health-related barriers such as fatigue, health related problems and lack of energy, as well as other difficulties such as sport transport, costs and accommodation <sup>(11, 12)</sup>.

Previous research has shown that the two main models which are frequently used in research, include the theory of planned behaviour (TPB), that focuses on a patient's attitude or perception, and the WHO's International Classification of Functioning, Disability and Health (ICF) that mainly looks at the perspective point of view or personal approach; focusing on the body, activity and participation of the patients in programs such as rehabilitation and sports<sup>(13)</sup>. The theory of planned behaviour (TPB) by Ajzen <sup>(13)</sup> suggests that there are three main components, which include the subjective belief a person has, the attitude and the perception of control over one's behaviour; which in turn effect intention, and ultimately the end behaviour. Therefore, the ideas or perceptions that a person has with regards to exercise or sports participation can ultimately affect the behaviour towards participating in a program and maintaining consistency after the rehabilitation is over.

Currently, in Malta there are no established guidelines with regards to recommendations for exercise and sport in rehabilitation. However, recommendations for physical activity in adults suffering from disability do exist and most of the European countries tend to focus their guidelines on the WHO recommendations<sup>(14)</sup>. This study was conducted to understand the perceptions of patients with regards to rehabilitation programs and sports participation prior to rehabilitation, and a comparison to after a rehabilitation stay at the main rehabilitation facility on the island, Karin Grech rehabilitation Hospital.



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## Methods

### *Literature review*

A literature review was carried out in order to collect information with regards to both local and international guidelines related to sports and exercise practices in rehabilitation. The main search was conducted using free online databases such as PubMed, EMBASE, Google Scholar and ResearchGate utilizing keywords such as 'rehabilitation', 'exercise' and 'sports in rehab', as well as 'perceptions of exercise in rehabilitation'. The main guidelines used as a standard for the study included the recommendations for exercise and fitness by the WHO and the Centre for Disease Control and Prevention (CDC). No guidelines could be identified within the local health service when it comes to exercise and sports in rehabilitation.

Various studies were collected in order to develop a questionnaire that included both qualitative and quantitative data collection items. The questionnaire consisted of a 24 question tool and was subdivided into sections which included the demographic data, the exercise and sports practices before rehabilitation intervention and the exercise and sports practices post rehabilitation, as well as the perceived barriers to partaking in both sports and exercise activity. Open-ended questions and Likert scale questions were included<sup>(15)</sup> allowing for more opinionated scoring. Open-ended questions were also included as they allowed for the gathering of more information<sup>(16)</sup> with regards to rehabilitation practices, identifying the patients' opinions towards the facilities and the type of services provided and the outcome perceived, providing a more in-depth analysis.

### *Development of the research tool*

The survey instrument was a structured questionnaire consisting of 24 questions covering demographics, previous and post rehabilitation participation in sports and exercise, opinions with regards to perceived benefits and barriers. The tool developed was tested for validity and reliability, where a test-retest method was employed to collect data over a 4 week period. A convenience sampling method was used to recruit participants that included five junior doctors, a clinical pharmacist, two medical students, two pharmacy students and a physiotherapist. The data collected from the pilot sample was then analyzed using statistical software IBM SPSS version 26 and Excel. In order to test for test-retest reliability an Intraclass correlation coefficient was carried out on the



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sample, while a cronbach alpha was used to measure the internal consistency of the tool <sup>(17)</sup>. The tool was found to have a good internal consistency, with a significant cronbach alpha ( $\alpha = 0.97$ ) and a high reliability score, with a significantly consistent intraclass correlation ( $ICC = 0.772$ ). The questionnaire was delivered via phone interviews in either English or Maltese languages.

#### *Participants*

The study population consisted of patients who had been inpatients at the rehabilitation ward at Karin Grech Rehabilitation Hospital in Malta during the period 2018 to 2019. Participants older than 75 years were omitted, as well as patients admitted before 2018 and during 2020 (due to changes in admission during the Covid19 pandemic). The post admission data was coded using Microsoft Excel. For each patient, the age group, the year of admission, the diagnosis and the locality were listed.

#### *Research Ethics*

Prior to the initiation of the study, a formal application was carried out for approval by the Ethics Committee of Karin Grech Rehabilitation Hospital. The authors were granted approval to proceed with the data collection.

#### *Data Analysis*

Data collected were codified and then analysed using both Microsoft Excel and IBM SPSS version 26 statistical software. Both descriptive statistics and analysis were employed to identify any significant statistical difference pre and post rehabilitation. A  $p$  value of less than 0.05 was taken to represent statistical significance. Non-parametric tests were used as the sample size collected was relatively small and the normality of the distribution could not be established (18). The Wilcoxon-signed rank test was utilized in order to identify significant variations between the mean scores of Likert scale data before and after the rehabilitation program intervention <sup>(19)</sup>. Additionally, the Chi-Square test was employed to analyse categorical variable data for the “Yes” and “No” questions pre and post intervention.



## Results

### *Sample Demographics*

The population sample consisted of 165 total patient admissions between 2018 (N=96) and 2019 (N=69) respectively. Some patients were excluded depending on their age and their date of rehabilitation hospital admission. Moreover, those participants who were admitted in previous years, or in 2020 were also excluded. Patients were then further excluded from this study, depending on whether they had actually replied to the phone call questionnaire; non-respondents were automatically excluded. A total of 93 participants (table 1) have responded to the phone based questionnaire. The majority of participants were aged 60 years and over (with a mean age of 57 years). Furthermore, the average duration stay in rehabilitation was of 3.4 months.

Fifty six participants (n=56) were men, and thirty seven participants (n=37) were women. The participants in the sample have originated from various localities on the island, majority from the Northern Harbour District (n=25), followed by the Northern (n=16) and Southern Harbour Districts (n=16), Western (n=13) as well as the Gozo and Comino district (n=3). (Table 1.)

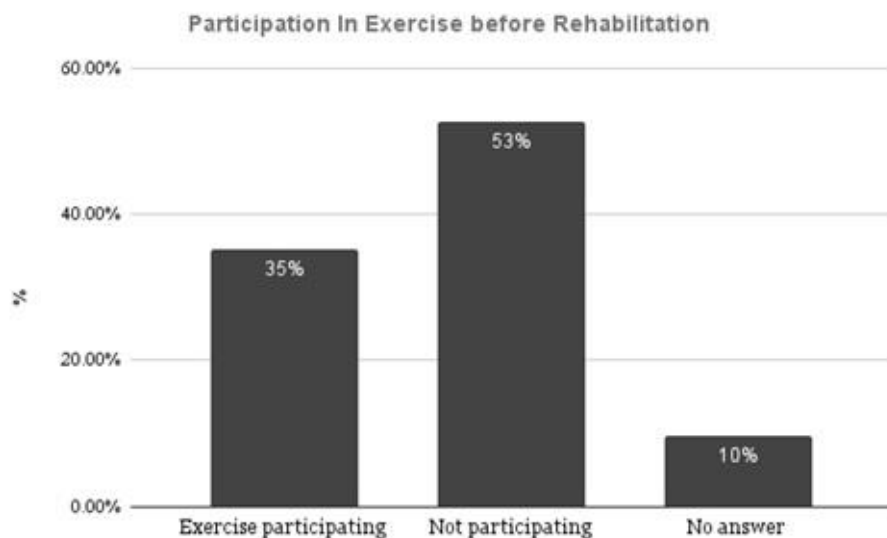
Table 1 - Demographics of respondents (N= 93)

| Variables                 | Frequency(N) | Percentage |
|---------------------------|--------------|------------|
| <b>Sex</b>                |              |            |
| Male                      | 56           | 60%        |
| Female                    | 37           | 40%        |
| <b>Locality</b>           |              |            |
| Northern Harbour District | 25           | 27%        |
| Northern District         | 16           | 17%        |
| Southern Harbour District | 16           | 17%        |
| Western                   | 13           | 14%        |
| Gozo and Comino           | 3            | 3%         |

*Interest in exercise and sports before rehabilitation*

The main themes that have been explored with regards to the perceptions related to exercise and sports before rehabilitation have included: (1) The reasons for exercising before rehabilitation, (2) the participation level in exercise or sports, (3) the perceived effects of exercise on the participants' quality of life (QOL), social-well being, mental well being and confidence levels, (4) the form of exercise, as well as (5) the frequency and the duration of exercise or sports prior to the rehabilitation intervention.

53% of the patients (n=49) stated that they did not participate in exercise before rehabilitation with only 35%(n = 33) exercising (Figure 1) . On the other hand, when the remaining patients were asked about the main reasons for exercising, the most common reasons given were: to increase fitness levels 8% (n=7), for recreational activity, as a form of hobby 7% (n=6), as a prevention of disease 5% (n=4) as well as for staying active 2% (n=2).



**Figure 1** – Percentage participation in exercise before rehabilitation

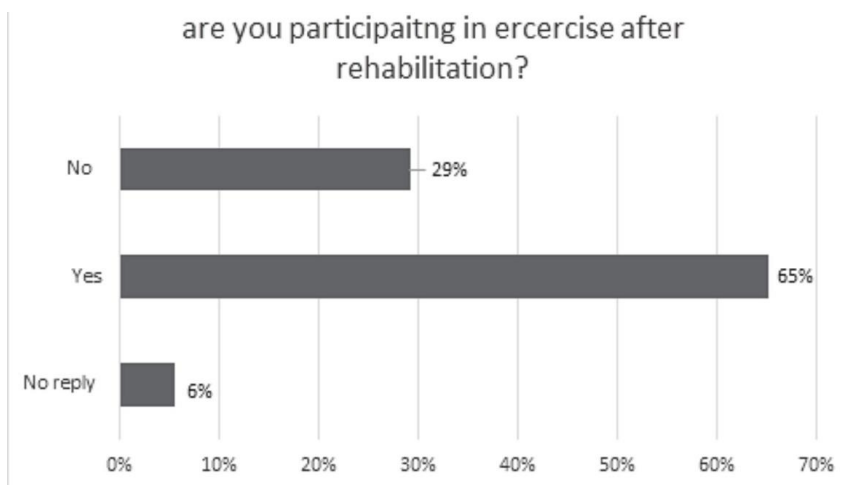
*Participation in exercise and sports before rehabilitation*

Prior to rehabilitation, the number of patients who took part in sports was 15% (n=17), with the majority of whom (48%, n=41) stating that they had never taken part in any form of sports. 37% (n=30) gave no response to this particular question.

With regards to the participants' opinions on sports and exercise, the majority 63% (n=56) of the participants have agreed that sports participation is important to improve their QOL and health, whilst 61% of the participants (n=54) have also agreed that it improves their mental well-being. Only 12% (n= 11) of participants have agreed that participation in sports is better than exercise alone, whilst the majority of participants (33%, n=29) have disagreed with this statement.

*Participation in exercise and sports post-rehabilitation*

Post rehabilitation, the majority of participants 65% (n=58) agreed that they were participating in a form of exercise(Figure2.). Thereby, an increase in the participants' participation in exercise post rehabilitation has been observed, compared with 37% of participants' participation in exercise (n=34) before rehabilitation. Results have shown a significant increase in exercise uptake ( $\chi^2 = 42.3$ ,  $p = 0.00$  ( $p < 0.05$ )). The remaining 29% of participants (n=26) were not currently participating in any form of exercise.



**Figure 2** – Percentage participation in exercise post rehabilitation



The majority of participants 64% (n=57) have stated that they wanted to exercise. Moreover, most of the participants in this study; 55% (n=49) also felt capable of exercising. 35% of participants (n=30) post rehabilitation have stated that walking is their main form of exercising, followed by weight training 12% (n=10), aerobic exercise 11% (n=9) and pool therapy 8% (n=7). Furthermore, when asked whether they would be willing to start a new form of exercise, 69% of the participants (n=61) have stated that they would start it if given the opportunity.

With regards to sports participation post rehabilitation 92.47% of participants (n=86) were not participating in any form of sport. The majority of participants; 51% (n=45) have strongly agreed with statements that sports participation improves their quality of life (QOL) and overall health and well-being ( $z=0.02$  ( $p<0.05$ )). Moreover, 49% of participants (n=43) have strongly agreed that sports also helps them to improve their mental health ( $z=0.01$  ( $p<0.05$ )), whilst 56% (n=49) of participants have strongly agreed that sports improves their social life ( $z=0.04$  ( $p < 0.05$ )). (Figure3.)

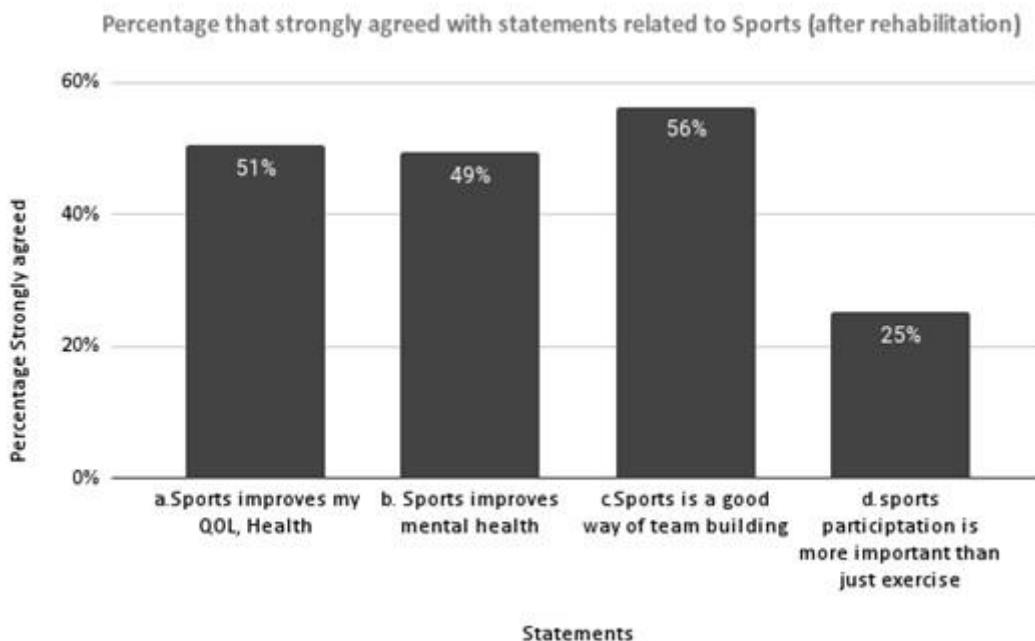


Figure 3 – Percentage that strongly agreed with statements related to sports (post rehabilitation)



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In addition, 43% of participants (n=37) have strongly disagreed that sports participation is more important than exercising alone. Statistical significance has been obtained in those agreements in which participants have stated that exercise was beneficial for their mental wellbeing ( $z=0.006$  ( $p<0.05$ )), as well as in their improvement in social life ( $z = 0.12$  ( $p < 0.05$ )).

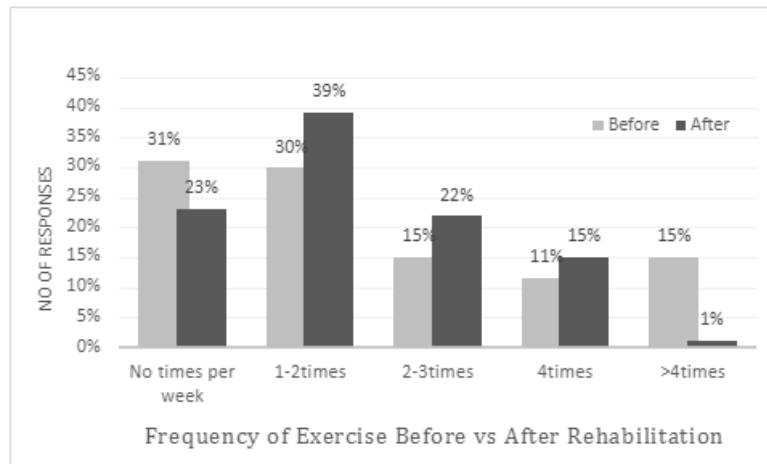
#### *The perceived barriers to exercise and sports*

The main barriers which were identified through this study as hindrance to sports and exercise participation have included: (1) socio-environmental barriers, as well as (2) personal beliefs about health and well-being. Most participants have strongly agreed with the statements that there is a lack of facilities available 42% (n=37) for them to take up regular exercise and sports activities. Furthermore, 36% of participants (n=32) have strongly agreed that there was a lack of assistance when this was needed, whilst 33% of participants (n=29) have strongly agreed that there was a lack of access, especially to patients with a disability; such as those requiring wheelchair access.

Personal factors which served as barriers to sports and exercise participation have included financial restrictions 61% (n=54), a lack of self-confidence 44%(n=39), a lack of self-efficacy 33% (n=29) in taking up sports and exercise as well as a lack of time 47% (n=41).

#### *Differences in the duration and the frequency of exercise and sports pre and post rehabilitation*

With regards to the frequency of exercise per week by participants (Figure 4.), an increase was observed before and after their rehabilitation therapy. The number of participants who have stated that they exercised 1-2 times per week has increased from 30% (n=26) pre-rehabilitation to 39% (n=34) post-rehabilitation. This increase was considered as statistically significant ( $\chi^2 = 60.835$ ,  $p = 0.00$ ( $p<0.05$ )).



**Figure 4** – The frequency of exercise before vs after rehabilitation program

With regards to the duration and the frequency of exercise after rehabilitation, most patients 24% (n=21) have exercised approximately 15-30minutes daily, followed by 23% (n=20) who have exercised for more than 30 minutes daily, whereas 22% (n=19) have exercised less than 15 minutes daily. Furthermore, 39% (n=34) of participants have stated to have a frequency of exercise of 1-2 times per week. In addition, only 15% (n=13) of participants were exercising more than 3 times a week.

### Discussion

The study sought to establish the perceived benefits of exercise and sports pre and post inpatient rehabilitation. Furthermore, certain patterns with regards to the level of physical activity and sports participation before and after rehabilitation were also addressed.

From the results of this study, it is evident that the majority of the participants (n=49) 53%, were relatively physically inactive prior to their rehabilitation therapy and did not partake in any form of exercise or sports. Such results were above the global average when compared to the global standardized average level of inactivity, which was approximately 27.5% in 2018 (data retrieved from 358 surveys from 168 countries, with 1.9 million participants)<sup>(20)</sup>. Furthermore, a study by Hallal, *et al.*, (2012) has revealed that Malta has a high proportion of inactive adults of both sexes



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accounting up to 71.9%<sup>(20)</sup>, which was also reflected in the pre-intervention period, showing a high percentage of physical inactivity.

When asked what were the perceived benefits to exercising, participants reported that prior to their rehabilitation they had no interest in exercise (n=11) 13%, because they were mostly too busy or had lacked motivation (n=4) 5%. The lack of motivation to start exercising was also identified in other studies where physical activity was regarded as being “difficult”<sup>(21, 22)</sup>. Most of the study participants have also identified “walking” to be their main form of exercise prior to rehabilitation. In comparison to other studies <sup>(23, 24)</sup>, participants have preferred to remain active through doing daily chores, shopping or working. In fact, a study by Raffety, *et al* (2002) exploring physical activity patterns with public health recommendations, has shown that walking is the most common leisure-time physical activity (LTPA) carried out by adults (57.6%). Albeit, compliance was found to be low of < 40%, even within the most liberal activity pattern group. Similarly to the findings in this study, walking was also the main form of exercise engaged in most participants, who have also displayed a low compliance to physical activity.

Although there were increased perceived benefits of exercise and sports post rehabilitation by this study’s participants, such finding is not considered of statistical significance. Similarly, the lack of perceived benefits to exercise and sports was also identified as a hindrance to the uptake of rehabilitation programs in other studies <sup>(25, 26)</sup>.

Specific barriers to exercise and sports participation that were identified in this study have included a lack of sports facilities, a lack of access, a lack of time, a lack of assistance (such as fitness personnel or qualified exercise staff), financial barriers, as well as low participants’ perception on self-efficacy or self-confidence in starting a form of exercise or sports. Self-efficacy or confidence in one's ability to partake in exercise, has long been established as a predictor of health outcomes <sup>(27)</sup>. In fact, another study by Boutevillain, *et al* (2017) has looked at several barriers and perceptions to exercise. Results have revealed that both physical and psychological factors could play a major role in hindering participation in exercise <sup>(28)</sup>. The major barriers that could be identified in this study



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were either cost-related, travel related, along with the presence of physical symptoms that have also prevented some patients from taking part in a rehabilitation program.

The majority of patients in this study were considered inactive prior to their rehabilitation. In fact, most study participants 29.8% (n=26) were exercising only 1-2 times per week. Following rehabilitation, the frequency of their exercise has increased to 39.1% (n=34). Such results show that the increase in the duration and frequency of exercise, post rehabilitation therapy was statistically significant from that registered pre-rehabilitation therapy. Moreover, the rehabilitation process seems to have a beneficial effect on the patients' outlook on exercise duration and frequency. This might also indicate that rehabilitation programs are effective in improving both the patients' perceptions and compliance to exercise. However, other benefits such as psychological well-being may be lost once there is non-adherence to a rehabilitation program<sup>(29)</sup>.

Having said this, sports participation amongst this study participants has remained low. In fact, 47% (n=44) of participants were not participating in any form of sports, nor competing in any competitive sports. The reason for this might have been that most of the patients in rehabilitation had a mean age of 57 years, so they could be less interested or less inclined in taking part in certain types of sports. As was also established in another study, patients who participated in sports, generally had a better mental well-being compared to non-athletes<sup>(30)</sup>. Comparingly, patients in this study have mostly agreed that sports participation leads to a beneficial effect on their QOL (72%), mental well being (68%) and social life (68%).

One study that has looked into the barriers as well as the facilitators to sports participation post-rehabilitation, has shown that focusing on the positive aspects of rehabilitation and reducing the physical barriers using various strategies are effective at increasing the patients' interest in taking up a sport<sup>(31)</sup>. Contrastingly, in this study, there was no significant difference in the participation or interest in sports before or after rehabilitation. Hence, further strategies might be developed to target and improve the perception of sports participation.



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### Conclusion

Currently, there is a lack of guidelines related to the use of sports and exercise in rehabilitation in Malta. Hence, this study sought to identify the perception of exercise and sports participation after inpatients' rehabilitation therapy. Moreover, this study has also identified several barriers to sports and exercise participation. Results from the preliminary study indicate a positive impact of rehabilitation on patients undergoing such programs, with the possibility of developing guidelines for a future setup of sports and exercise programs as part of rehabilitation services in Malta.

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*Authors' contributions.* Author A, Author B and author C have given substantial contributions to the conception or the design of the manuscript, author A and author C to acquisition, analysis and interpretation of the data. All authors have participated to drafting the manuscript and have revised it critically. All authors read and approved the final version of the manuscript.

*Congresses.* This paper was not yet presented at any congresses to date.

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