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THE INFLUENCE OF PHYSICAL EXERCISE AND SPORTS ACTIVITIES ON THE MENTAL HEALTH OF PERSONS DEPRIVED OF LIBERTY

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ABSTRACT

This study aims to determine if there is a significant relationship between physical exercise and sports activities and mental health using a quantitative non-experimental research design employing a correlational technique. 310 Persons Deprived of Liberty (PDL) currently incarcerated at Davao Prison and Penal Farm (DPPF) were included as respondents for this study. Mean scores, Pearson's r , Correlation Method, and Linear Regression Analysis are the statistical treatments utilized to analyze the data gathered. The result of statistical treatments revealed that there is a very high participation rate among the PDL in both physical exercise and sports activities. Additionally, the level of mental health among the PDL is also at a very high level. Furthermore, it was found that physical exercise and sports activities significantly influence the mental health level of the PDL. These findings suggest that participation in both physical exercise and sports activities is helpful in improving the mental health of the PDL incarcerated at Davao Prison and Penal Farm, and can be an effective tool to alleviate possible consequences of mental health problems inside prison settings.

KEYWORDS: Physical Exercise, Sports Activities, Mental Health, Persons Deprived Of Liberty (PDL)

1. INTRODUCTION

Prison facilities around the world are currently holding a large number of Persons Deprived of Liberty (PDL). It was estimated that there are around 11 million PDLs held inside prisons around the world (Forrester et al., 2019). In the Philippines, there are more than 215,000 PDL incarcerated across 558 prison facilities across the country (ABS-CBN News, 2019), and among these numbers, Davao Prison and Penal Farm has 9,444 PDL under its custody. With this large PDL population, mental health problems are one of the main concerns in prison settings. Among these mental health concerns is the prevalence of depression, anxiety, and other psychotic disorders (Gómez-Figueroa & Camino-Proañó, 2021).

These mental health issues among PDL occurred because of the negative impact of incarceration on their mental state (Scheyett & Crawford, 2020, as cited by Ricciardelli et al., 2022). These problems

arise from their experiences inside prison compounds, including the new environment, system, violence (Convocar et al., 2020), and disconnection with their families and society (Cunha et al., 2023), as a result, they tend to experience loneliness, disinterestedness to do other things, symptoms of anorexia, agitation, and possible rage (Gonzales, 2020).

With the reality of the existence of mental health problems among the PDL, there must be an intervention to help them recover, or else, their situation will just worsen. It was in consonance with the research findings of Stringer (2019) and Morse (2017), explaining that the mental well-being of any prisoner can deteriorate if not treated or addressed. Additionally, mental health must not be ignored because it will further bring problems to the prison facilities and the community. It was suggested by the World Health Organization [WHO] (2014) that treating and or helping prisoners cope with their mental health is important both for the order inside prison facilities, and outside the community after their release.

In this regard, the researcher wanted to examine whether physical exercise and sports activities can serve as an intervention for mental health problems in prison settings. Physical exercise is one of the reformation programs of the Sports and Recreation Section implemented in the PDL (RA 10575, 2013). This program aims to promote a healthy lifestyle among the PDL. But in the general population, it was already established by a myriad of studies that physical exercise can reduce mental health problems. This claim can be attributed to the positive effect of physical exercise on the mental well-being of an individual by reducing the symptoms of depression and anxiety (Bell et al., 2019) through improving the cognitive function and development of self-esteem (Sharma et al., 2006; Huge, 2022). It was further substantiated by a study review conducted by Alexandratos et al. (2012) using the 17 significant articles, which also found that exercise can alleviate the symptoms of mental health problems, including psychotic symptoms, by causing good mood, mental alertness, improved concentration, and undisturbed sleeping. Additionally, Adling & Kale (2016) also pointed out the same findings, but reasoned that, because physical exercise makes the person physically fit and active, it helps lessen cholesterol, high blood pressure, diabetes, and other health problems that can affect brain functions.

In addition to this, sports activities are also part of the reformation program of the Sports and Recreation Section (RA 10575, 2013). This program primarily aims to promote camaraderie, a healthy lifestyle, and self-development among the PDL. And like physical exercise, sports activities were also proven to improve the mental health of the general population. According to Herimath (2019), participating in sports events will enable the individual to develop socially, causing well-developed self-esteem, self-confidence, and discipline. Additionally, sports activities participation would also help in reducing stress levels among the participants. Consequently, Tahira (2023) further emphasized that the positive effect is not only limited to alleviating the symptoms of anxiety, depression, and other mental health issues, but also extends to reducing habits that can lead to these problems and can result in fewer internalized problems, which is vital in maintaining mental wellbeing.

But amid all the positive findings that pointed out the positive effects of physical exercise and sports activities on mental health, the author found that these findings are mostly in the general population and not in prison settings. With this, the researcher wishes to examine if these findings would also be consistent inside the prison settings, particularly for the PDL at Davao Prison and Penal Farm (DPPF).

The main objective of this study is to determine the influence of sports activities and physical exercise on the mental health of the PDL currently incarcerated at Davao Prison and Penal Farm. To achieve the main objective, this research was specifically conducted to address the following objectives: first, to describe the level of physical exercise in terms of strenuous physical exercise, moderate physical exercise, and mild physical exercise. Secondly, to describe the level of sports activities in terms of common interest, social spaces, and competition. The third is to describe the level of mental health in terms of depression and anxiety. In addition to this, the researcher also aims to determine the significant relationship between the level of physical exercise and the level of sports activities to the mental health of PDL at DPPF. Furthermore, the researcher would like to determine which domain of sports activities significantly predicts the mental health of PDL at DPPF. Lastly, the researcher would like to determine which domain of physical exercise significantly predicts the mental health of PDL at DPPF.

2. METHODS

Research Respondents. Respondents of this study are Persons Deprived of Liberty (PDL) who are actively participating in the mandatory and intensive program of Sports and Recreation Section (SARS)– DPPF that are aged between 18-40 years old, has 80-100% monthly attendance rate in both physical exercise and sports activities program, and are able to read and write with average comprehension level to English language.

Meanwhile, the researcher excluded PDL that are only active in sports activities and not in morning exercise and vice versa, has below 80% attendance rate to physical exercise and sports activities, 41 years old and above, and has low literacy level based on the assessment of Education and Training Section as respondents of this study.

Stratified random sampling was employed by grouping the PDL according to their security status. PDLs who passed the above-mentioned criteria are randomly chosen. Among the 1350 qualified respondents from the three (3) security camps, 310 were determined as research respondents. In addition to this, those PDL who will choose to withdraw their participation from this study are allowed to do so without any prejudice or consequences. The researcher sternly observed voluntary participation during the data-gathering process.

Materials and Instruments. In order to collect the needed data for the measurement of the first independent variable (physical exercise), the researcher utilized the adapted questionnaire based on

the Godin Leisure-Time Exercise Questionnaire from the study of Amireault et al. (2015). The original questionnaire underwent modification in order to suit the concept and purpose of this study. The questionnaire has 15 questions in a form of a Likert Scale that ranges from very low (1) to very high (5), and measures the level of PDL participation to physical exercise using the following indicators: strenuous physical exercise (5), moderate physical exercise (5), and mild physical exercise (5).

In addition to this, the questionnaire for the second independent variable (sports activities) was adapted from the Sense of Community in Sports Scale from the study of Warner et al. (2013). The instrument has 15 questions in a form of a Likert Scale that ranges from very low (1) to very high (5), and was focused on assessing the level of PDL engagement sports participants encompassing three (3) indicators: common interest (5), social spaces (5), and competition (5).

Lastly, the dependent variable (mental health) of this study was measured using the modified questionnaire from Burn's Depression Checklist and Burn's Anxiety Inventory from the study conducted by Demers (2013). The modified questionnaire has 10 questions in a form of a Likert Scale that ranges from very low (1) to very high (5), and was focused on measuring the level of mental health of PDL based on the level of two (2) indicators: depression (5) and anxiety (5). All the instruments modified questionnaires that aim to measure the variables were subjected to internal and external validation to establish the validity of the questionnaires, and also underwent a reliability test before utilization.

Design and Procedure. This study utilized a quantitative non-experimental research design employing a correlational technique to measure whether participation in physical exercise and sports activities has an influence on the mental health of PDL.

The collected data were subjected to statistical treatment and interpreted based on the purpose of the study. Mean is a statistical treatment that was used to determine the level of physical exercise, sports activity, and mental health among the PDL. Meanwhile, Pearson's r was used to identify if there is a significant relationship between physical exercise and sports activities and the mental health of PDL. Lastly, Multiple Regression Analysis was utilized to measure the influence of physical exercise and sports activities on the mental health of the PDL.

3. RESULTS

Level of Physical Exercise. Table 1 shows the level of physical exercise among the PDL based on the following indicators: Strenuous Physical Exercise, Moderate Physical Exercise, and Mild Physical Exercise. Among the indicators, Strenuous Physical Exercise got the highest mean with 4.49, followed by Mild Physical Exercise with 4.46, and Moderate Physical Exercise with 4.46. All three indicators denote a very high descriptive equivalent. In totality, the level of physical exercise among the PDL denotes a very high descriptive equivalent with a mean value of 4.47 and a standard deviation of 0.339, which indicates that PDL respondents have a very high level of participation in physical exercise.

The very high descriptive equivalents on the level of physical exercise among the PDL are expected, given the fact that the participants chosen as respondents of this study are those who are actively participating in daily physical exercise.

Table 1: Level of Physical Exercise Among the Persons Deprived of Liberty (PDL)

Indicators	Mean	SD	Descriptive Equivalent
Strenuous Physical Exercise	4.49	0.458	Very High
Moderate Physical Exercise	4.46	0.453	Very High
Mild Physical Exercise	4.46	0.482	Very High
Overall Mean	4.47	0.339	Very High

Strenuous physical exercise is the level of physical exercise that the PDL preferred most. This can be attributed to their daily routine, which involves intense physical exercise like jogging or running early in the morning. Some of these PDL participants participate in a much heavier exercise routine, like weightlifting and other gym activities. With the lack of anything to do inside the prison compound, these PDL tend to engage in physical activities that would most likely tire them in order to distract them and keep them away from boredom.

In addition to this, existing literature has no identified factors that can directly affect the participation of PDL inside the prison settings, because this topic was not widely searched. But in the general population, there is literature that points out some factors that can influence participation in physical exercise. Hu et al. (2021) identified factors including gender, age, social support from other people, and access to facilities that can influence a person's level of participation in mental health.

And thus, since all the participants, in this study are male PDL, very high level of participation to physical exercise was in congruence with result of study conducted by Endozo & Oluyinka (2019) to the 470 male and female university students, where it was found out that male students are more active in participating to physical exercise than female students. A very high level of physical exercise among the PDL can also be attributed to the programs implemented by reformation officers, particularly the Sports and Recreation Section personnel, which promote and facilitate these activities. Constantly monitoring and encouraging PDL to participate in physical exercise due to its good effect to their overall health also helps in increasing their participation rate.

Level of Sports Activities. Table 2 shows the level of sports activities engagement among the PDL based on the following indicators: Common Interest, Social Spaces, and Competition. Among the indicators, Common Interest got the highest mean with 4.53, followed by Competition with 4.49, and Social Spaces with 4.46. All three indicators denote a very high descriptive equivalent. In totality, the level of sports activities based on the sense of community among the PDL shows a very high descriptive equivalent with a mean value of 4.49 and a standard deviation of 0.401, which indicates a very high level of sports activity engagement among the PDL.

Table 2: Level of Sports Activities Among the Persons Deprived of Liberty (PDL)

Indicators	Mean	SD	Descriptive Equivalent
Common Interest	4.53	0.434	Very High
Social Spaces	4.46	0.475	Very High
Competition	4.49	0.485	Very High
Overall	4.49	0.401	Very High

A very high level of sports activities engagement among the PDL respondents can also be attributed to the positive impact of sports activities on their social life. This is supported by the study of Hauzinger (2018) as cited by Libbrecht et al. (2024), which concluded that sports activities give an opportunity to develop positive relationships among PDL. It serves as an avenue for the PDL to set their own goals, follow routines, and make connections to other players they played with, eventually leading to a positive outlook in life.

Additionally, Nima (2023) also supports this idea, stating that people playing the same sports will most likely develop a sports community. These people who share a common interest tend to make common goals for their community, share their individual knowledge and experiences, and participate in activities they plan. Part of these activities are friendly competitions and training that would promote communication and unity among the members.

Furthermore, Sherlock (2024) reasoned that these sports communities in which individual players belong break social barriers, develop inclusivity, and discourage inequalities among their members. With this, they feel a sense of belongingness and learn mutual respect for others. All in all, this type of community fosters safe spaces for sports participants.

Table 3 demonstrates the overall mean score of 4.50, described as very high for all indicators of organizational performance, with a standard deviation of 0.498. This implies that the level of organizational performance is highly observable. The highest rated indicator was quality

improvements at 4.53, followed by employee satisfaction at 4.50, and service quality at 4.48, all considered with very high ratings.

Level of Mental Health. Table 3 shows the level of mental health among the PDL based on the following indicators: Anxiety and Depression. All the questions from this variable are positive, which means that the calculated mean will be interpreted like the other two variables presented.

Among the indicators, Depression got the highest mean with 4.39, followed by Anxiety with 4.32. Both indicators denote a very high descriptive equivalent. In totality, the level of mental health denotes a very high descriptive equivalent with a mean value of 4.35 and a standard deviation of 0.447, which indicates a very high level of mental health among the PDL.

Table 3: Level of Mental Health Among the Persons Deprived of Liberty (PDL)

Indicators	Mean	SD	Descriptive Equivalent
Anxiety	4.32	0.589	Very High
Depression	4.39	0.555	Very High
Overall	4.35	0.447	Very High

There is ample literature that supports the idea of PDLs' tendency and vulnerability to develop mental health issues inside the prison settings due to many stressors related to their incarceration. With the prevalence of these stressors, PDL may develop depression and anxiety (Bhusal et al., 2024; Quandt & Jones, 2021). But the statistical treatment of data gathered from PDL respondents shows a very high level of mental health.

Consequently, very high level of mental health among the PDL is supported by literatures, which presented factors that can explain this high level of mental health, including family visits (Machado et al., 2024), leisure activities (Yau & Packer, 2002 as cited by Gungormus et al. 2024), and outdoor and sports activities (Muller & Bukten, 2019 as cited by Liguori & Calella, 2024). And in this study, the researcher only focuses on the two possible factors that can mitigate the prevalence of mental health problems among the PDL population: physical exercise and sports activities.

Significant Relationship between Physical Exercise and Mental Health. One of the objectives of this study is to determine if there is a significant relationship between physical exercise and mental health using Regression Analysis and the Pearson r correlation method. Table 4 shows the calculated r value of 0.576 with a p value of <0.001. This means that there is a moderate positive correlation between physical exercise and mental health. This further connotes that when the level of physical exercise participation among PDL increases, their level of mental health will also tend to increase. In addition to this, the p-value denotes that the correlation between physical exercise and mental health is highly statistically significant.

In addition to this, Table 4 also shows the relationship between the indicators of physical exercise to the mental health of the PDL. It can be observed that strenuous physical exercise and mild physical exercise have the p-value of <0.001 and 0.013, respectively. It means that these two indicators are the only statistically significant factors that can predict mental health.

Table 4: Regression Analysis on the Influence of the Domains of Physical Exercise on Mental Health

Indicators	Unstandardized Coefficients		Standardized Coefficients	t-value	p-value	Decision
	B	SE	Beta			
(constant)	1.013	0.283				
Strenuous	0.517	0.063	0.450	8.152	<.001	Ho is rejected
Moderate	0.033	0.084	0.029	0.039	0.694	Ho is not rejected
Mild	0.194	0.078	0.178	2.504	0.013	Ho is rejected
Dependent Variable: Mental Health						
*p<0.05 R= 0.576 R2=0.332 F value=145.485 P value = <.001						

Additionally, Table 5 shows the result of the Pearson r correlation method between the variables of physical exercise and the level of mental health. It shows consistent results with regression analysis, where strenuous and mild level physical exercise have the highest r value of 0.549 and 0.414, respectively, which means that these two variables can significantly predict mental health at a moderate level. Moderate physical exercise has the lowest r value of 0.391, and it has a weak positive correlation to the mental health of PDL.

This positive correlation between physical exercise and mental health is in paralleled with the study of Mahindru et al. (2023) and Liliaa et al. (2023), which highlighted the positive effects of physical exercise to mental health, explaining that physical exercise can lessen the symptoms of depression, anxiety and other psychiatric disorders, improve the quality of sleep, and promote good mood, leading to a better mental health.

Table 5: Significance of the Relationship Between Physical Exercise and Mental Health

Indicators	Dependent Variable	r-value	p-value	Decision
Strenuous	Mental Health	0.549	< .001	Reject Ho
Moderate		0.391	< .001	Reject Ho
Mild		0.414	< .001	Reject Ho

*Significant at the 0.05 level of significance

In addition to this, the study conducted by Abilleira et al. (2023) at the penitentiary institutions in the Autonomous Community of Galicia in Spain also supported this claim. It was found out that those prisoners who are actively participating in physical exercises have a higher level of mental health and lower symptoms of anxiety and depression. They further explained that participating in physical exercises lessens the feeling of despair among the prisoners, and along the way, this becomes the coping strategy that leads to a decrease in the levels of depression and anxiety, leading to positive mental health.

Also, the study conducted by Psychou et al. (2019) on the Greek inmates across Greece's penitentiaries further affirmed this result, where it was found that a three-session-per-week exercise among the inmates shows a positive effect on mental and physical health, as well as the overall quality of life. Participants reported that they tend to be more energetic, experience fewer problems, and feel more vigorous compared to less active inmates. And thus, it was concluded that participating in physical exercises can improve quality of life, and increase the level of physical and mental health.

Accordingly, strenuous physical exercise and mild physical exercise are the only variables that can predict the mental health of PDL compared to other indicators based on the result of regression analysis. It was also in congruence with the study of Robinson et al. (2025), which pointed out that participating in strenuous physical exercise like running or jogging for 15 minutes or simple walking for 1 hour can help reduce the symptoms of depression by 26%.

And thus, with the promising effects of regular exercise on mental health, it was suggested by Arsovic et al. (2019) that regular exercise can help treat patients with mental health problems in the general population. It was further recommended by Noetel (2024) and Pinex (2020) that strenuous physical exercise like jogging, and gym activities, or mild ones like simple walking every day are more effective in decreasing the symptoms of depression. With this, it is hereby concluded by Mutz & Muller (2023) that physical activities inside prison camps can be a remedy to address the mental health issues of the PDL.

Significant Relationship Between Sports Activities and Mental Health. Another objective of this study is to determine the significant relationship between sports activities and mental health. Table 6 shows the calculated r value of 0.592 with a p value of <0.001. This means that there is a moderate positive correlation that exists between sports activities and mental health. This further connotes that when the level of sports activities engagement increases, the level of mental health will also tend to

increase. In addition to this, the p-value denotes that the correlation between sports activities and mental health is highly statistically significant.

In addition to this, Table 6 further shows the indicators of sports activities and their relationship to mental health. It can be observed that social spaces and competition are the only indicators that can significantly predict the mental health of the PDL based on their p-value, which measures the level of significance.

Table 6: Regression Analysis on the Influence of the Domains of Sports Activities on Mental Health

Indicators	Unstandardized Coefficients		Standardized Coefficients	t-value	p-value	Decision
	B	SE	Beta			
(constant)	1.060	0.273				
Common Interest	0.060	0.08	0.049	0.746	0.456	Ho is not rejected
Social Spaces	0.378	0.071	0.341	5.302	<.001	Ho is rejected
Competition	0.298	0.071	0.274	4.193	<.001	Ho is rejected
Dependent Variable: Mental Health						
*p<0.05 R=0.592 R2=0.351 F value=55.124 p value= <.001						

Moreover, Table 7 shows the result of the Pearson r correlation method between the variables of sports activities and mental health. It also shows consistent results with regression analysis, where social spaces and competition have the highest R value of 0.545 and 0.520, respectively, which means that these two variables can significantly predict mental health at a moderate level. Common interest has the lowest R value of 0.447, which also shows a moderate positive correlation with mental health.

Table 7: Significance of the Relationship Between Sports Activities and Mental Health

Indicators	Dependent Variable	r-value	p-value	Decision
Common Interest	Mental Health	0.447	< .001	Reject Ho
Social Spaces		0.545	< .001	Reject Ho
Competition		0.520	< .001	Reject Ho

*Significant at the 0.05 level of significance

This result is in congruence with the results of the literature review conducted by Ahmadi-Hekmatikar et al. (2022) as cited by Akinwunmi (2023), which highlighted positive effects of participation in sports events on mental health. It was found out that regular participation in sports activities can help lessen the symptoms of mental health problems like depression and anxiety. It was further expounded by Akinwunmi (2023), explaining that sports activities can improve mood, memory, and psychological health. This effect also extends to the social aspect of the person, where social connections were created serving as a support system to deal with personal problems.

This idea was further supported by Bhandari (2024), by presenting the idea that participation to sports activities is effective in helping the body release endorphins, which is the hormone responsible in relieving pain and stress. This hormone aids in reducing stress hormones like cortisol and adrenaline. In addition to this, playing sports can also make the person focus on the game at hand, diverting the attention to other problems that affect mental health. This leads to calmness and better sleep.

Additionally, the social factor in sports engagement and its effect was also discussed by Vanderkruik (2024), presenting the idea that social interactions between co-players and the sport community as a whole can positively affect the mental health of the person. This means that it is not just about the physical aspect that can help improve mental health; social aspects of sports can also be significant. This idea was also in line with the findings of the study conducted by Eime et al. (2013) as cited by Karakitsiou et al. (2025), which highlights that team sports have a higher effect on mental health compared to individual sports. This happens due to the social engagement of players during sports events.

Moreover, Social Spaces and Competition are the only indicators that significantly predict the mental health of the PDL. This finding is supported by Quirk's Media (2024), which states that healthy competition among sports participants can improve mental well-being because it develops self-confidence, sense of accomplishment, and sense of belongingness to the teams involved in the healthy competition. Furthermore, it builds mutual support among members through social bonds and sharing of experiences inside the newly created social space.

In addition to this, Prince (2023) claimed that healthy competition can also form a sense of community

and social support. These are formed along the way while playing sports events. Playing with other people serves as an opportunity to create a connection among other players with the same passion and interest. When these connections are made, a sense of belongingness to a particular sports community or social space is also created, thereby serving as social support that can address individual problems of each member, leading to better mental health.

Lastly, amid the established positive connection between sports activities and mental health in the general population, only a few studies have been conducted in prison settings. But the results are also like those of the connection between sports activities and mental health in the general population. For instance, the study conducted by Mutz & Muller (2023) across the 12 prisons of the federal state of Hesse, Germany, found that greater time spent participating in sports activities resulted in better outcomes for the mental health of the PDL. Also, Hilpisch et al. (2023) further supported this notion, explaining that sports activities can also positively affect the physical and social aspects of the person.

4. CONCLUSIONS AND RECOMMENDATIONS

Conclusion. It can be concluded from the interpretation of statistical treatment results that the Persons Deprived of Liberty currently incarcerated at Davao Prison and Penal Farm have a very high level of participation in physical exercise, sports activities engagement, and mental health across all the indicators of the mentioned variables.

Additionally, there is a positive and significant relationship that exists between physical exercise and sports activities and the mental health of the PDL, but at a moderate level for both independent variables.

Lastly, it can also be concluded that Strenuous Physical Exercise and Mild Physical Exercise are the only indicators of Physical Exercise that can statistically predict the mental health of the PDL. Competition and Social Spaces are the only indicators of Sports Activities that can significantly predict the mental health of the PDL.

Recommendations. The researcher recommends sustaining the very high level of physical exercise participation and sports activities engagement among Persons Deprived of Liberty (PDL) through the continuous implementation of sports and recreation programs as part of the reformation and rehabilitation program of Davao Prison and Penal Farm.

Finally, since this study shows a positive significant relationship between physical exercise and sports activities to the mental health of the PDL, it is also recommended to keep on implementing strategies that would further encourage all PDL to continue their participation in physical exercises and sports activities. These strategies may include provisions of sports materials and activity areas for the conduct of these programs. It can also include conducting seminars, orientations, and training, which highlight the positive impact of sports and physical exercise activities on their mental health.

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