



## The Relationship Between Physical Activity and who Assist Scores in Substance Addiction Clients at the Addiction Polyclinic of Prof Ngoerah General Hospital Denpasar



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### Keywords

addiction;  
ASSIST score;  
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physical activity;  
substance;

### Abstract

Drug abuse which includes narcotic, psychotropic, and addictive substances can affect the central nervous system function. Substances are often abused because of the pleasurable and calming effects of their use. Physical activity is said to have the potential as an adjunct therapy for substance addiction disorders. The purpose of the study was to determine the relationship between physical activity and WHO ASSIST scores in substance addiction clients. This study used a cross-sectional design on substance addiction clients undergoing treatment at the Addiction Polyclinic of Prof Ngoerah General Hospital Denpasar. Physical activity score checks were conducted using GPAQ questionnaires and WHO ASSIST scores. Data collection for patients as research subjects was carried out after obtaining informed consent. After data was collected, the next stage was data analysis using SPSS, with descriptive statistical analysis, normality test and Spearman correlation test. From 30 samples, an average GPAQ score of  $2099.33 \pm 2225.32$  was obtained. The average WHO ASSIST score for each substance was highest in tobacco  $15.57 \pm 8.98$  and lowest in hallucinogen  $0.70 \pm 1.664$ . Analysis of the relationship with the Spearman Correlation test obtained GPAQ Score with Alcohol WHO ASSIST Score ( $r = -0.560$ ,  $p = 0.001$ ), GPAQ Score with Benzodiazepines WHO ASSIST Score ( $r = -0.696$ ,  $p = 0.000$ ), and GPAQ score with Tobacco WHO ASSIST Score ( $r = -0.605$ ,  $p = 0.000$ ). This study concludes that there is a strong and significant inverse relationship between physical activity and WHO ASSIST scores in alcohol, benzodiazepine and tobacco use. Physical activity may be indicated as a protective factor or therapeutic potential in substance use.

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## 1 Introduction

Substance abuse is one of the biggest health problems in the world. World Health Organization (WHO) data shows that 2.5 million people die from alcohol abuse each year, and at least 15.3 million people have substance abuse disorders (Wang et al., 2014).

While in Indonesia today, based on data collection from the Drug Information System (SIN) application, the number of narcotics cases successfully revealed during the last 5 years from 2012-2016 per year is 76.53 percent. The highest increase in 2014 was 161.22 percent. In 2016 the number of drug cases that were successfully revealed was 868 cases, this number increased by 16.67 percent from 2015 (Ministry of Health RI, 2017).

Drugs in medical terms are called drugs or substances. It includes narcotics, psychotropics, and other addictive substances. This substance can be a natural and synthetic form that when consumed causes changes in physical and psychological function, and causes dependence or addiction (BNN, 2009). Several factors influence the occurrence of addiction. Risk factors can be categorized based on social factors, psychological factors, and biological factors (Aryani & Lesmana, 2019)

Physical activity can be an influential factor and is associated with substance use disorders. Physical activity also has potential as an additional therapy for substance addiction. Some studies show physical activity has a positive effect on improving symptoms of substance addiction (Goeders, 2003; Le Moal & Koob, 2007; Goodman, 2008).

This study was conducted to determine the relationship between physical activity and ASSIST scores in substance addiction clients at the Addiction Polyclinic of Prof Ngoerah General Hospital Denpasar. In the future, it is hoped that physical activity can be studied in the occurrence of substance use disorders and can also be considered as an additional therapy for substance addiction clients (Liu & Fang, 2002; Boles & Miotto, 2003).

## 2 Materials and Methods

This study was a cross-sectional study. Observation (measurement) of the variables studied without intervening and then an analysis of the relationship between independent and dependent variables was carried out. The research was conducted at the Addiction Polyclinic of Prof Ngoerah with research time in March-September 2023.

### *Sampling and participant*

The target population is substance addiction clients based on their level of physical activity. The affordable population of this study is substance addiction clients based on their level of physical activity at the Addiction Polyclinic of Prof. Ngoerah General Hospital Denpasar. The calculation of sample size in this study uses the sample size formula with  $Z\alpha$  = type I error set at 5% = 1.64,  $Z\beta$  = type II error set at 10% = 1.28, and  $r$  = minimum correlation which is considered meaningful ranging from -0.22 to -0.61. Based on the calculation results using a formula by Dahlan (2018), the research sample size was 30 samples 5,6.

The sample in this study was substance-addicted clients based on their level of physical activity who met the inclusion criteria in the form of substance addiction clients at the Addiction Polyclinic of Prof Ngoerah General Hospital Denpasar and were willing to collaborate in participating in research programs. The exclusion criteria in sample selection are having severe physical illness, having severe mental disorders, and having disabilities. The research variables set by independent variables are the physical activity of drug addiction clients, dependent variables are ASSIST scores and controlled variables are age, gender, education, and occupation (Hides et al., 2009; Lupón et al., 2015).

### *Procedure and analysis*

The research was conducted after obtaining ethical clearance (Research Ethics Commission Unit of Medical Faculty of Udayana University No: 2166/UN14.2.2.VII.14/LT/2023) and a research permit (Education and Research Unit of Prof. Ngoerah General Hospital No DP.04.03/D.XIV. 2.2.2/49827/2023). Data collection for patients as research subjects was carried out after obtaining informed consent. Addiction screening is done by interviewing and looking at the patient's medical record. Clients who experience substance addiction disorders will be used as research samples. Sampling is carried out using consecutive sampling techniques, namely samples that meet the inclusion criteria, obtained from patients who visit healthcare facilities. The final stage is a physical activity assessment using the GPAQ questionnaire and also assessed substance addiction assessment with the client's WHO ASSIST score (Sastroasmoro, 2022).

In this study, all research data were analyzed using the SPSS for Windows Program. The data entered into the research form is then recorded in the master table. To answer the research problem, a series of stages of data analysis were carried out. The first stage of data selection, namely editing, coding and tabulation is included in the navigator file of the Statistical Package for the Social Sciences (SPSS) program. The next stage is descriptive statistical analysis to describe the general characteristics and distribution of various variables. Categorical scale data is described in terms of frequency and percentage, while numerical scale data is in the form of mean and standard deviation. Free and dependent variable data in the form of numerical data were tested for data normality with the Kolmogorov-Smirnov One-Sample Test. Pearson correlation test when the data is normally distributed or Spearman correlation test when the data is not normally distributed to see the relationship between physical activity score and substance addiction score. The level of significance in this study was set at  $p < 0.05$ . (Bize et al., 2007; Tucker et al., 2011)

## **3 Results and Discussions**

### *3.1 Results*

The study produced data on the characteristics of research respondents which can be seen in Table 1. Of the total 30 male respondents, it was found that 16 of them (53.3%) were married, 23 people (76.7%) had a high school education, and in the classification of physical activity levels found a dominant moderate level of 12 people (40%). From the results of determining the degree of addiction using WHO ASSIST, the tendency of addiction to each substance was obtained as follows: mild alcohol addiction 16 (53.3%), moderate addiction to opioids 13 (43.3%), mild addiction to cannabis 10 people (33.3%), severe addiction to benzodiazepines 7 people (23.3%), mild cocaine addiction 2 (6.7%), mild addiction to stimulants 4 (13.3%), moderate addiction to hallucinogens 3 (10%), and moderate addiction to tobacco amounting to 20 people (66.7%). Based on these data (Table 1) it appears that the tendency of study respondents to still be in the condition of addiction varies from mild to severe in all types of substances.

Table 1  
Demographic characteristics of research respondents

Variable	Total (n = 30)	Percentage (100%)
Sex		
• Male	30	100%
Marital Status		
• Unmarried	10	33,3%
• Married	16	53,3%
• Divorce	4	13,3%
Educational Status		
• Junior High School	2	6,7%
• Senior High School	23	76,7%
• Bachelor Degree	4	13,3%
• Post Graduate Degree	1	3,3%
Classification of Physical Activity Levels		
• Low	10	33,3%
• Moderate	12	40,0%
• High	8	26,7%
Alcohol Addiction Levels		
• No Addiction		
• Mild Addiction	5	16,7%
• Moderate Addiction	16	53,3%
• Sever Addiction	4	13,3%
Tingkat Adiksi Levels	5	16,7%
• No Addiction		
• Mild Addiction	8	26,7%
• Moderate Addiction	8	26,7%
• Severe Addiction	13	43,3%
Cannabis Addiction Levels	1	3,3%
• No Addiction		
• Mild Addiction	16	53,3%
• Moderate Addiction	10	33,3%
• Severe Addiction	4	13,3%
Benzodiazepine Addiction Levels	0	0%
• No Addiction		
• Mild Addiction	17	56,7%
• Moderate Addiction	3	10,0%
• Severe Addiction	3	10,0%
Cocaine Addiction Levels	7	23,3%
• No Addiction		
• Mild Addiction	27	90,0%
• Moderate Addiction	2	6,7%
• Severe Addiction	1	3,3%
Stimulant Addiction Levels	0	0%
• No Addiction		
• Mild Addiction	24	80%
• Moderate Addiction	4	13,3%
• Severe Addiction	2	6,7%
Hallucinogen Addiction Levels	0	0%
• No Addiction		
• Mild Addiction	25	83,3%

• Moderate Addiction	2	6,7%
• Severe Addiction	3	10,0%
Tobacco Addiction Levels	0	0
• No Addiction		
• Mild Addiction	2	6,7%
• Moderate Addiction	3	10%
• Severe Addiction	20	66,7%
	5	16,7%

Based on the results of the assessment of respondents related to physical activity using the GPAQ questionnaire and substance addiction variables with WHO ASSIST assessment, data can be displayed according to Table 2. From 30 samples, an average GPAQ score of  $2099.33 \pm 2225.32$  was obtained. The average WHO ASSIST score for each substance obtained the highest score on the Tobacco Use Variable with an average of  $15.57 \pm 8.98$  and the lowest score on Hallucinogen was  $0.70 \pm 1.664$ . The entire interval data was tested for data normality with Kolmogorov Smirnov with a result of  $p < 0.005$  which showed abnormally distributed data.

From the overall variable interval on the WHO ASSIST score for each type of substance and physical activity score (GPAQ), abnormally distributed data were obtained. For correlation assessment, a Non-Parametric Correlation Test with Spearman was conducted. In 30 respondents, 3 Strong Correlations were obtained that were Inversely Proportional ( $r$  minus value), namely: GPAQ Score with Alcohol ASSIST Score ( $r = -0.560$ ,  $p = 0.001$ ), GPAQ Score with Benzodiazepine ASSIST Score ( $r = -0.696$ ,  $p = 0.000$ ), and GPAQ Score with Tobacco ASSIST Score ( $r = -0.605$ ,  $p = 0.000$ ).

Table 2  
Descriptive Data of Physical Activity Score (GPA) and Drug Addiction Score (WHO ASSIST)

Variable Type	N	Mean	Std. Deviation
Alcohol Score	30	9,70	11,265
Opioid Score	30	7,67	8,616
Cannabis Score	30	3,03	5,798
Benzodiazepine Score	30	8,90	13,448
Cocaine Score	30	0,33	1,028
Stimulant Score	30	1,03	2,906
Hallucinogen Score	30	0,70	1,664
Tobacco Score	30	15,57	8,970
Solvent Score	30	0,00	0,000
GPAQ Score (Met)	30	2099,33	2225,318

Table 3  
Relationship between Physical Activity Score (GPAQ) and Substance Addiction Score (WHO ASSIST)

Variable Name	Correlation Coefficient with GPAQ Score ( $r$ )	Significance (2-tailed) ( $p$ )
Alcohol Score	-0,560	0,001*
Opioid Score	0,302	0,105
Cannabis Score	-0,133	0,485
Benzodiazepine Score	-0,696	0,000*
Cocaine Score	0,217	0,250
Stimulant Score	-0,052	0,784
Hallucinogen Score	-0,205	0,277
Tobacco Score	-0,605	0,000*

Table Description: (\*) indicates statistically significant test results with  $p < 0.005$

The value of the correlation coefficient ( $r$ ) was assessed on a scale: 0.01-0.09: very weak relationship, 0.1-0.29: weak relationship, 0.3-0.49: medium relationship, 0.5-0.69: strong relationship, 0.7-0.89: very strong relationship, >0.9: near-perfect relationship.

Based on these results seen in Table 3. indicates that there is a strong inversely related relationship between physical activity and ASSIST scores for alcohol, benzodiazepine and tobacco use. The inversely related relationship in this study shows that a higher physical activity score (GPAQ) will be associated with a lower substance addiction score based on WHO ASSIST. The results of this study indicate that physical activity can play a role as a protective factor or potential future therapy in drug abuse in drug addiction clients at the Addiction Polyclinic of Prof Ngoerah General Hospital Denpasar.

### *3.2 Discussions*

These results are following research conducted by [Wang et al. \(2014\)](#), which found the positive effect of physical activity on substance addiction disorders which was confirmed in research with animals. It was found that there was a decrease in withdrawal behavior in mice with morphine addiction by running on a wheel. Physical exercise on a treadmill is said to reduce the use of cocaine, morphine, nicotine and alcohol in various types of mice ([Ernawati et al., 2022](#)). The protective effects of physical activity are also evident in various transition phases of substance addiction disorders, including the initiation phase, progression from substance use to substance addiction, withdrawal and relapse periods in alcohol, nicotine, and other substance abuse disorders, and improvements in overall mood and quality of life in people with substance addiction disorders ([Wang et al., 2014](#), [Ducci & Goldman, 2012](#)). According to research conducted by [Zhang et al. \(2021\)](#), physical activity has a positive effect in reducing drug cravings in individuals with SUD. In addition, in the sports rehabilitation process for SUD, moderate or high amounts of physical activity are needed to effectively reduce and relieve drug addiction ([Zhang et al., 2020](#), [Zhang et al., 2021](#)). Research conducted by Strickland et al., found resistance training reduced cocaine self-administration and reduced BDNF expression in the nucleus accumbens after a history of cocaine exposure, so these findings suggest that strength training reduces the positive reinforcing effects of cocaine and may decrease cocaine use in the human population ([Strickland et al., 2016](#)).

## **4 Conclusion**

There was a strong and significant inverse relationship between physical activity and WHO ASSIST scores for alcohol, benzodiazepine and tobacco use in substance addiction clients at the Addiction Polyclinic of RSUP Prof. Dr. I.G.N.G Prof. Ngoerah Denpasar. A higher physical activity score (GPAQ) will be associated with lower drug addiction based on the WHO ASSIST score. Physical activity can be indicated as a protective factor or potential therapy in substance users so that more severe substance addiction disorders can be prevented. This indicates that physical activity in substance users can be used as a reference for the treatment of clients who experience substance addiction so that they can reduce the level of dependency and return to recovery and activities in society.



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