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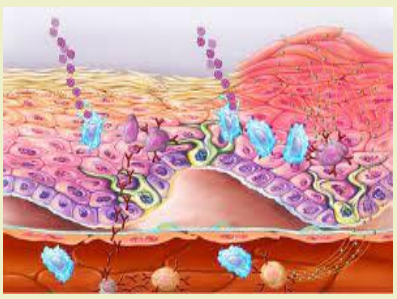

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ORIGINAL ARTICLE

Assessment of Cardiovascular Fitness Among Young Sedentary Adults Using 1600 M Walking Test

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ABSTRACT

Background: Cardiorespiratory endurance refers to the ability of the heart and lungs to deliver oxygen to working muscles during continuous physical activity, which is an important indicator of physical health. Physical activity is a complex multidimensional behaviour that is difficult to assess in free-living populations and for which a gold standard measurement does not exist. Thereby, we assessed cardiovascular fitness among young sedentary adults using 1600 M walking test.

Methods: The study participants were assessed for Pulse rate, Respiratory rate, Blood pressure and oxygen saturation at rest followed by 1st, 2nd, 3rd and after 5 minutes after 1600 M walking test.

Results: There were no significant changes in pulse rate, respiratory rate, blood pressure; both systolic and diastolic blood pressure, and oxygen saturation across both the genders after performing 1600 M walk at 1st 2nd and 5th minutes except significant changes for respiratory rate (P=0.03) & systolic blood pressure (P =0.02).

Conclusion: There is no single gold standard for estimating the cardiac endurance and fitness. It has to be assessed for Vo2 along with basic parameters and need to be repeated to validate the outcome and reduce the bias in case of aerobic exercises.

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Introduction

Human evolution has been dependent on a physically active lifestyle supplemented with nutritional fortification.[1] A physically active lifestyle is 1 of the 7 goals listed for ideal cardiovascular health in the 2020 American Heart Association impact goals. [2] Physical activity is a complex multidimensional behaviour that is difficult to assess in free-living populations and for which a gold standard measurement does not exist. [3,4] The 4 dimensions of physical activity include (1) mode or type of activity, (2) frequency of performing activity, (3) duration of performing activity, and (4) intensity of performing activity.[2]

Cardiorespiratory endurance is an important aspect of health that affects a person's physical and mental activity. This is indicated by the absolute intensity determined by external work, while the relative intensity is determined relative to the individual's cardiorespiratory fitness level (V̇o2max). [5] Walking, for instance, is often described as a moderate-intensity physical activity; however, the actual intensity for an individual may vary. Measures of physical activity derived from heart rate monitoring are typically time spent in physical activities at different intensity levels (eg, moderate and vigorous intensity). [2]

Living environments in developed countries are characterized by low daily energy expenditure and an abundant and inexpensive calorie-dense food supply, making positive energy balance common. [1] Numerous investigators have confirmed the strong link between physical activity and health in a variety of populations. [4] There are major challenges to disentangling the complex multifactorial etiology of physical activity, adiposity and health outcomes. [1] Lack of physical activity can have adverse effects and is often associated with chronic diseases, including heart disease, type 2 diabetes mellitus, hypertension, obesity, osteoporosis, depression, and breast and colorectal cancer.[6,7]

As such, a variety of methods have been used to assess physical activity and these measurements have a broad range of accuracy, reproducibility, and feasibility. [4] So, in this study we have used 1600 M walking test along with Vo2 Max, Heart Rate and Respiratory rate to assess the cardiovascular endurance among the sedentary adults and compared it across the gender. We hypothesise that these above parameters collectively can be used to determine the cardiovascular endurance and validate the fitness of the individual.

Materials & Methods:

A Cross sectional study was conducted under the auspices of department of physiology among 188 male and 212 female study participants. Institutional ethical committee clearance & a written informed consent from the study participants were obtained.

The heart rate and blood pressure among the study participants were measured in seated position at rest before sending them for 1600 M walking test. This was followed by continuous heart rate monitoring and recording of blood pressure for every three minutes during the test. By using oximeter, “Pulse rate, Respiratory rate, systolic & diastolic blood pressure along with oxygen saturations were measured and recorded in the 1st, 3rd & 5th minutes after the test and before the test in both the genders”.

Statistical Analysis

The data was evaluated with the IBM SPSS Statistics 16.0 to compare the outcomes across the two groups. Two sample t test and confidence interval of 95% is used. $P<0.05$ is considered as statistically significant and $P<0.01$ is considered as highly statistically significant.

Results:

A total of 400 study participants among which 188 were male and 212 were female participants. All the participants have been measured for their anthropometric indices. They were checked for the basic parameters like Pulse rate, Respiratory rate, Blood pressure and oxygen saturation at rest. These study participants were informed to complete the 1600 M walking test. Following the walking test reading with regard to pulse rate, respiratory rate, systolic and diastolic blood pressure and oxygen saturation were recorded immediately after the walk followed after 1st, 2nd, 3rd and after 5 minutes.

Table 1: Cardiovascular endurance across pulse rate at rest, immediately after exercise, 1,2, 3 and 5 minutes

Variable	Mean	Std. Dev.	95% Conf. Interval		t	P
Pulse	84.3883	10.03061	82.94513	85.83146	-1.4377	0.1513
rate_At	85.78302	9.365162	84.51509	87.05094		
Pulse	109.4628	12.58569	107.652	111.2735	-1.0946	0.2743
rate_	110.9198	13.87856	109.0408	112.7988		
Ime						
Pulse	104.4043	11.81436	102.7045	106.1041	0.5234	0.6010
rate_ 1	103.7406	13.35883	101.9319	105.5492		
Pulse	98.87234	9.948245	97.44102	100.3037	0.1695	0.8655
rate_ 2	98.69811	10.53153	97.27228	100.124		
Pulse	91.78723	9.972017	90.3525	93.22197	-0.3797	0.7044
rate_ 3	92.17453	10.3632	90.77148	93.57758		
Pulse	90.61702	8.705652	89.36449	91.86956	0.8696	0.1643
rate_ 5	90.46698	9.467522	89.1852	91.74876		

Table 2: Cardiovascular endurance across Respiratory rate at rest, immediately after exercise, 1,2, 3 and 5 minutes

Variable	Mean	Std. Dev.	95% Conf. Interval		t	P
Respiratory	15.21277	3.274835	14.7416	15.68394	-1.2112	0.2265
rate _At	15.84906	6.508897	14.96783	16.73028		
Respiratory	25.46277	5.364141	24.69099	26.23454	0.2352	0.8142
rate _ Ime	25.34906	4.291604	24.76803	25.93009		
Respiratory	22.90426	3.572231	22.3903	23.41821	-1.1786	0.2393
rate _ 1	23.65566	8.067213	22.56346	24.74786		
Respiratory	19.54787	2.135227	19.24066	19.85508	-1.8918	0.0592
rate _ 2	19.98585	2.456211	19.65331	20.31839		
Respiratory	17.68617	1.921569	17.4097	17.96264	-2.1344	0.0334*
rate _ 3	19.11321	8.985845	17.89664	20.32978		
Respiratory	16.6117	1.675004	16.37071	16.8527	-1.1734	0.2414
rate _ 5	17.23585	7.119897	16.2719	18.19979		

Table 3: Cardiovascular endurance across Blood Pressure at 1,2, 3 and 5 minutes using 1600-meter walking test

Variable	Mean	Std. Dev.	95% Conf. Interval		t	P
SBP _ Atr	112.9787	10.82083	111.4219	114.5356	0.6163	0.5381

	112.3443	9.76692	111.022	113.6667		
DBP _ Atr	79.11702	2.674324	78.73225	79.50179	-0.3465	0.7292
	79.31132	7.263964	78.32787	80.29477		
SBP _ Ime	127.617	13.63709	125.655	129.5791	0.2948	0.7683
	127.2217	13.15467	125.4407	129.0027		
DBP _ Ime	73.51064	13.17853	71.61456	75.40672	-0.3056	0.7600
	73.90566	12.65138	72.19282	75.6185		
SBP _ 1min	123.9149	10.11343	122.4598	125.37	1.9099	0.0569
	121.8868	11.01298	120.3958	123.3778		
DBP _ 1min	74.86702	9.238861	73.53777	76.19627	0.0286	0.9772
	74.83962	9.828999	73.5089	76.17035		
SBP _ 2min	120.0532	11.52942	118.3944	121.712	1.7543	0.0802
	117.9953	11.86715	116.3886	119.6019		
DBP _ 2min	72.2766	7.8378	71.14892	73.40427	0.0559	0.9554
	72.23113	8.35744	71.09964	73.36262		
SBP _ 3min	116.2394	8.294779	115.0459	117.4328	2.3278	0.0204*
	114.0896	9.965651	112.7404	115.4388		
DBP _ 3min	73.79787	5.062349	73.06952	74.52622	0.4123	0.6803
	73.56132	6.256827	72.71423	74.40842		
SBP _ 5min	109.5798	10.61575	108.0524	111.1071	1.1748	0.2408
	108.4009	9.454034	107.121	109.6809		
DBP _ 5min	68.29787	8.289327	67.10524	69.49051	-0.8726	0.3834
	69.0566	9.011662	67.83654	70.27667		

Table 4: Cardiovascular endurance across Oxygen saturation at rest, immediately after exercise, 1,2, 3 and 5 minutes

Variable	Mean	Std. Dev.	95% Conf. Interval		t	P
O_2 Sat._At	96.68085	.9888444	96.53858	96.82312	-0.0299	0.9762
	96.68396	1.083757	96.53724	96.83069		
O_2 Sat._ Ime	95.42021	2.405212	95.07416	95.76627	-0.8332	0.4053
	95.62736	2.547707	95.28243	95.97229		
O_2 Sat._ 1	94.48404	3.890859	93.92424	95.04384	-1.5315	0.1264
	95	2.813306	94.61911	95.38089		
O_2 Sat._ 2	95.85106	1.634896	95.61584	96.08629	-0.9908	0.3224
	95.97642	.7995321	95.86817	96.08466		
O_2 Sat._ 3	95.54255	1.510497	95.32523	95.75988	-0.2952	0.7680
	95.58491	1.358616	95.40097	95.76885		
O_2 Sat._ 5	96.27128	1.314593	96.08214	96.46042	1.0330	0.3023
	96.13679	1.286151	95.96266	96.31092		

Among these study participants, there were no significant changes in pulse rate, respiratory rate, blood pressure; both systolic and diastolic blood pressure, and oxygen saturation across both the genders after performing 1600 M walk at 1st 2nd and 5th minutes except significant changes for respiratory rate (P=0.03) & systolic blood pressure (P =0.02), both, after 3 minutes were found. (Table 2 & 3)

Discussion:

Physical activity (PA) is one of the most important contributors to maintaining optimal health, and considerable evidence suggests that sufficient PA has the potential to prevent numerous diseases and provide health benefits to people of all ages.[8]

This study provides evidence that there is no single gold standard test for assessing the cardiovascular endurance and fitness of any individual. High level of cardiorespiratory fitness in childhood could be a protective factor of cardiovascular disease in adulthood.[9] Fitness education and student fitness assessments offer students an opportunity to assess, track, and improve their fitness level. The effects of cardiovascular risk factors on health may partly be mediated through physical fitness level but the level of cardiorespiratory fitness is highly associated with the performance of other health-related fitness parameters in young people and in adults.[10,11] In this study we could find that there were no significant changes in any of the parameters tested; Pulse rate, Respiratory rate, Blood pressure and Oxygen saturation except at one point for Respiratory rate & Blood pressure indicating that the assessment should include more than one tests which will increase the validity and these tests should be assessed repeatedly to overcome the confounding variables and bias. The findings of this study did not correlate with other study showing significant changes which would be due to the increase in the number of assessments.[11]

It is well known that individuals with regular physical activity have a lower risk of developing cardiovascular diseases, hypertension, type 2 diabetes, obesity and other chronic diseases. Therefore, performing regular cardiorespiratory exercise improves exercise capability which in turn increase cardiorespiratory fitness and results in short and long-term benefits on overall health.[12] Thereby, consideration of study participants pertaining to the duration of exercise will help in eliciting their cardiovascular endurance using 1600 M walking test.

In this study we could not find any significant change in oxygen saturation across the gender. This finding was correlated with other studies done irrespective of their gender and ethnicities.[5]

Limitations of the study

1. The study has not included other variables affecting the cardiovascular endurance; Lifestyle and nutrition which may act as confounding variables in bringing up the expected change among the study participants.
2. The expected change in cardiovascular endurance has been studied with only one test;1600 M walk. This either, if, done repeatedly and done along with other tests may show better results and outcome among the study participants.

Conclusion:

The treatment of noncommunicable diseases (NCD), like coronary heart disease or type 2 diabetes mellitus, causes rising costs for the health system. Physical activity is supposed to reduce the risk for these diseases. [13] There is no single gold standard for estimating the cardiac endurance and fitness. It has to be assessed for Vo2 along with basic parameters and need to be repeated to validate the outcome and reduce the bias in case of aerobic exercises.

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Conflicts of Interest

There are no conflicts of interest declared by the author.

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ORIGINAL ARTICLE

Relationship Of Water Source Location And Physical Quality Of Water With The Event Of Diarrhea In Toddlers (in Purwodadi Village, Purwodadi District, Pasuruan Regency)

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ABSTRACT

Background: Diarrheal disease is a health problem until how and is the leading cause of death in toddlers. It is supported by environmental sanitation and personal hygiene of the community which is still poor. The use as bad water sources will also affect the quality of the water, so it can increase the risk of diarrheal in the community.

Method: This type of research is analytical observational with cross sectional design. The samples used were 75 out of a population of 523 mothers who had toddlers and lived in Purwodadi Village, Purwodadi Subdistrict, Pasuruan Regency, with purposive sampling techniques. Using questionnaire method, as well as statistical test using chi-square with the help of computer software.

Result: The results of this study showed that there was a significant association between the location of the sheltered water source as many as 38 respondents (50.7%) and unprotected as many as 37 respondents (49.3%) with a value of p = 0.003, as well as the physical quality of water that qualified as many as 37 respondents (49.3%) and did not qualify as many as 38 respondents (50.7%) with a value of p = 0.000, against the incidence of diarrhea in toddlers, where the value of $p \leq 0.05$.

Conclusion: Location of water source and physical quality of water is related to the incidence of diarrhea in toddlers.

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Introduction

According to the World Health Organization (WHO), diarrhea is the presence of stools with a soft and liquid consistency and more frequent (three or more times a day).[1] Diarrhea in children is divided into acute diarrhea, persistent diarrhea, and dysentery. Acute diarrhea in children is classified based on the status of dehydration (no dehydration, mild/moderate dehydration, severe dehydration) and the symptoms appear suddenly in less than 14 days. Persistentdiarrhea is acute diarrhea with or without blood lasting for 14 days or more and is classified basedon the dehydration status, namely, moderate or severe. Dysentery is characterized by bloody diarrhea, usually caused by *Shigella*.[2]

In 2017, WHO states that cases of diarrhea in toddlers reach 1.7 billion with a deathrate of around 525,000 people each year.[3] The prevalence of diarrhea in Indonesia, according to the 2018 National Basic Health Research (Riskesdas), the incidence of diarrhea in toddlers aged 1-4 years reached 11.5%. Five provinces in Indonesia with the highest prevalence of diarrhea in children under five are North Sumatra (14.2%), Papua (13.9%), Aceh (13.8%), Bengkulu (13.6%), and West Nusa Tenggara (13.4%). Based on gender, diarrhea in males (11.4%) washigher than females (10.5%). The prevalence of children under five with diarrhea in East Java reaches 56.6% of all districts and cities. Pasuruan, one of Regency in East Java, presentage of reached 64.3% with anincidence rate was 12,851 cases, while Purwodadi Subdistrict achieved 2,105 cases in 2015.[4] Diarrhea in children under five in Indonesia is an endemic disease that has the potential for Extraordinary Events (KLB). Toddlers are very susceptible to diarrhea because their immune system is still weak. The most common cause of deaths are dehydration and lack of sufficient fluids.[5]

Environmental factors include one of the factors related to the occurrence of diarrhea in toddlers, such as the lack of clean water availability, polluted water, lack of hygiene facilities, indiscriminate and unhygienic disposal of feces, poor personal hygiene, and lack of parental knowledge about cleanliness.[6] Many other factors can cause diarrhea either directly or indirectly, such as triggering agents and behavior factors.[7] Diarrhea can be caused by the lack of quality of hygiene and sanitation of the community's environment which is still poor. Poor environmental sanitation, will have an impact on the incidence of disease. The community needs to strive for a healthy and comfortable environmental sanitation, in order to avoid a disease.

The purpose of this study was to analyze the relationship between the location of water sources and the physical quality of water with the incidence of diarrhea in children under five in Purwodadi Village, Purwodadi District, Pasuruan Regency.

Methods

The study was analytical observational with cross-sectional design. Subjects were 75 of 523 mothers who had toddlers and lived in Purwodadi Village, Purwodadi Subdistrict, Pasuruan Regency with purposive sampling techniques. Primary data obtained from using a questionnaire and will be tested for validity and reliability. In this study, researchers used the Chi-square statistical test with the Statistical Product and Service Solutions (SPSS) program to assess the significant relationship between the independent variable and the dependent variable.

Results

Based on the results of observations and data processing that has been carried out, data on the characteristics of respondents are obtained which aims to provide an overview of respondents based on several categories as fol

Table 1 Characteristics of Respondents

Characteristics	Respondents =75	
	F	(%)
Mother's Age		
21-30 Years Old	40	53,3%
31-40 Years Old	28	37,3%
>41 Years Old	7	9,3%
Tingkat Pendidikan		
Primary school	3	4,0%
Junior High School	10	13,3%
Senior High School	35	46,7%
Bachelor	27	36,0%
Toddler Gender		
Male	42	56,0%
Female	33	44,0%
Toddler Age		
1-2 Years Old	42	56,0%
3-4 Years Old	33	56,0%

Based on Table 1, the most susceptible mothers are 21-30 years old, with as many as 40 respondents (53.3%). Most of them work as housewives as many as 42 respondents (56.0%),with a high school education level of 35 respondents (46.7%). Boys are more than girl as 42 respondents (56.0%), with the most vulnerable are under five years old between 1-2 years as 42 respondent (56.0%).

Table 2 Frequency Distribution of Respondents' Diarrhea in Purwodadi Village, Purwodadi District, Pasuruan Regency

	Diarrhea	Respondents =75	
		F	(%)
1.	Diarrhea	28	37,3%
2.	No Diarrhea	47	62,7%

Based on Table 2, it can be seen that the incidence of diarrhea in respondents as many as 28 respondents (37.3%) experienced diarrhea, while 47 respondents (62.7%) did not experience diarrhea in the last six months.

Table 3 Results of the Relationship between Water Source Locations and Diarrhea in Toddlers in Purwodadi Village, Purwodadi District, Pasuruan Regency

Water Source Location	Diarrhea Events				Total		P
	Diarrhea		No Diarrhea				
	F	%	F	%	F	%	
1. Protected	8	10,7%	30	40,0%	38	50,7%	0,003
2. Unproctected	20	26,7%	17	22,7%	37	49,3%	
Total	28	37,3%	47	62,7%	75	100%	

Based on Table 3, it can be seen that the location of respondents' unprotected water sources is 37 respondents (49.3%), while for protected water sources as many as 38 respondents (50.7%). The result of the statistical calculations using the Chi-Square test, p-value = 0.003 was obtained where the value was 0.05, so it can be concluded that there is a significant relationship between the location of water sources and the incidence of diarrhea in children under five in Purwodadi Village, Purwodadi District, Pasuruan Regency.

Table 4 Results of the Relationship between Physical Quality of Water and the Incidence of Diarrhea in Toddlers in Purwodadi Village, Purwodadi District, Pasuruan Regency

Physical Quality of Water		Diarrhea Events				Total		P
		Diarrhea		No Diarrhea				
		F	%	F	%	F	%	
1.	Qualify	6	8,0%	31	41,3%	37	49,3%	0,000
2.	Not Eligible	22	29,3%	16	21,3%	38	50,7%	
	Total	28	37,3%	47	62,7%	75	100%	

Based on Table 4, it can be seen that the physical quality of water respondents who do not meet the requirements are 38 respondents (50.7%), while for the physical quality of water that meets the requirements are 37 respondents (49.3%). The results of statistical calculations using the Chi-Square test obtained p value = 0.000 where the value is 0.05, so it can be concluded that there is a significant relationship between the physical quality of water and the incidence of diarrhea in children under five in Purwodadi Village, Purwodadi District, Pasuruan Regency.

Tabel 5 Relationship of Water Source Location and Physical Quality of Water with Diarrhea in Toddlers in Purwodadi Village, Purwodadi District, Pasuruan Regency

No.	Variabel	p Value	Hypothesis
1.	Water Source Location	0,003	Accepted
2.	Physical Quality of Water	0,000	Accepted

Based on the table 4, results of statistical calculations with the Chi-Square test of the two research variables compared to the incidence of diarrhea in children under five in Purwodadi Village, Purwodadi District, Pasuruan Regency, it showed that the two variables had a significant relationship to the incidence of diarrhea, with each p value 0.05.

Discussion

Based on the results of research from 75 respondents, 37 respondents (49.3%) were found with unprotected water sources. The location of this unprotected water source caused 20 respondents to experience diarrhea, which obtained p-value = 0.003 (≤ 0.05), which means that there is a significant relationship between the location of the water source and the incidence of diarrhea in toddlers.

Water is a resource that must be owned by humans. Water also plays a role in transmitting disease transmission, because water can contain infectious germs. These infectious germs can be transmitted by faecal-oral route, through water lines and equipment lines that are washed with water.[8] Clean water sources will affect the cleanliness of the eating and drinking utensils used, if the water used is contaminated with germs, the eating and drinking utensils will also be contaminated which can later cause a chain of diarrhea transmission.[9]

This result is also strengthened by the research of Harsa (2019), which concludes that there is a relationship between the location of the water source and the incidence of diarrhea in children under five with a percentage of 58.3% of 75 respondents. Another

study conducted by Rahmawati (2018) regarding the risk factors for diarrhea related to environmental sanitation in infants in Ngijo Village, Karangploso District, Malang Regency, found that the incidence of diarrhea was most commonly found in respondents who still used water from dug wells and rivers.

Based on field observations, there are some respondents who still use unprotected water sources such as open wells and rivers, and the distance of the septic tank is still 10 meters from the water source. The results of the above discussion can be concluded that there is a relationship between the location of water sources with the incidence of diarrhea in children under five in Purwodadi Village, Purwodadi District, Pasuruan Regency.

The results of this research statistical test of 75 respondents, obtained 38 respondents (50.7%) with the physical quality of water that does not meet the requirements. The physical quality of water that does not meet these requirements causes 22 respondents to experience diarrhea, where the p-value = 0.000 (≤ 0.05) means that there is a significant relationship between the physical quality of water and the incidence of diarrhea in children under five.

The physical quality of water needs to be considered before being used, where water that is suitable for use is water that meets health requirements. Minister of Health Regulation Number 492/MENKES/PER/IV/2010 mentions the requirements for drinking water quality, one of which is the physical requirements which include odorless, colorless, tasteless, and not cloudy water.[10]

The results of this study are in line with Profita's research (2014) which concludes that there is a relationship between the physical quality of water and the incidence of diarrhea in children under five, with a p-value = 0.012 (≤ 0.05). Another study conducted by Kurniati et al (2013) also supports that the physical quality of water is related to the incidence of diarrhea in children under five in the work area of the Banget Ayu Health Center Semarang. The physical quality of water that does not meet these requirements contains many infectious germs, so the water used is contaminated and can cause diseases such as diarrhea.[11]

Based on the observations of the researchers, it was found that the number of respondents under five who did not experience diarrhea was greater than the number of respondents who had diarrhea. This can be caused by several factors, one of which is mothers of toddlers who treat water properly so that the water consumed is proper and safe to use and reduces the risk of toddlers getting diarrhea.

The results of observations in the field, it was found that several respondents whose water conditions did not meet health requirements, namely the water still smelled, colored, tasted, and cloudy. This condition can be caused because most respondents use water from open wells or river water. The results of the discussion above can be concluded that there is a relationship between the physical quality of water and the incidence of diarrhea in children under five in Purwodadi Village, Purwodadi District, Pasuruan Regency.

Conclusion

Based on the results of research on 75 samples that have been carried out, it can be concluded that there is a significant relationship between the location of water sources and the incidence of diarrhea in children under five in Purwodadi Village, Purwodadi District, Pasuruan Regency with p value = 0.003 <0.05. and a significant relationship between the physical quality of water and the incidence of diarrhea in children under five in Purwodadi Village, Purwodadi District, Pasuruan Regency with p value = 0.000 <0.05

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ORIGINAL ARTICLE

The Relationship Between Sunscreen Application and Severity Of Melasma

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ABSTRACT

Melasma is commonly observed in community among women of reproductive age. Incidence of melasma at least nine times higher in women than men, especially in pregnant women. The relationship between sunscreen application and melasma in women of reproductive age has not been widely studied and the correlation is not clear. This study aims to determine the relationship between sunscreen use and severity of melasma in women of reproductive age. An analytical observational cross-sectional study was conducted among 31 women of productive age.

The results showed that 14 respondents had good sunscreen usage habit (45.2%), whereas 17 respondents had sun protector irregularly (54.8%). A total 27 respondents (74.2%) had mild melasma, whereas 3 respondents had moderate melasma (22.6%) and 1 respondent had severe melasma (3.2%). The Chi-Square test shows that the significance value (p) = 0.000 (p <0.05) so that there is a significant relationship, meaning that there is a relationship between the use of sunscreen and severity of melasma in women of reproductive age.

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Introduction

Melasma, formerly known as chloasma, is the most common hyperpigmented of the skin, particularly on the face (Ogbechie-Godec & Elbuluk, 2017). It appears as mild to dark brown hyperpigmentation with symmetrical shape and irregular borders. The prevalence varies from 1.5% to 33% depends on the population (Huang *et al*., 2010 disitasi dalam Passeron & Picardo, 2018; Basit *et al.*, 2021).

Genetic factors, UV exposure and hormonal influence are the most common etiologic factors (Grimes, 1995 disitasi dalam Sarkar *et al*., 2020). Ultra violet radiation can trigger and worsen melasma because it was thought to activate nitric oxide induced by reactive oxygen species (ROS) (Ogbechie-Godec, O.A., & Elbuluk, 2017). Sun exposure shows an important role in the occurrence of UV radiation, which means that the higher sun exposure result in increasing severity of melasma (Ai, Young Lee, 2014 cited in Murniastuti, D.S. et al., 2020).

Various scoring systems have been proposed to evaluate the severity of melasma. The modified Melasma Area and Severity Index (mMASI) scores have the same validity and reliability as the Melasma Area and Severity Index (MASI) scores, one of the most popular and earliest scoring systems used (Abou-Taleb, D.A. et al, 2017 cited in Murniastuti, D.S. et al., 2020).

Treatment and prevention of melasma can begin with prevention of risk factors, protection against UV exposure and treating the lesions. Inhibition of the melanin synthesis pathway, decreased transfer of melanosomes to keratinocytes and accelerated removal of melanin are the therapeutic principles of melasma. Avoiding sun exposure is important for the improvement and prevention of melasma recurrence such as sunscreen application (Trivedi et al., 2017; Sarkar et al., 2018; Elcistia & Zulkarnain, 2019).

Sunscreen is a substance that helps reduce the amount of UV radiation by reflecting or absorbing harmful UV rays. Use sunscreen regularly can reduce the risk of skin cancer, premature aging, sunburn and other skin diseases caused by UV radiation (Xu et al., 2016). Broad-spectrum sunscreen (SPF 30) application was shown to reduce nevi in children in a 2000 study (Young et al., 2017). The incidence of melasma often occurs in Indonesia, because the majority of population has Fitzpatrick IV skin type (Suryaningsih et al., 2019). Based on the description above, authors are interested in conducting research on "The Relationship between Sunscreen Application and Severity of Melasma".

Methods

The analytic observational design was used because there was no intervention or treatment for variables in data or collecting information. The research method used is quantitative research or observation was obtained through identification of the size of variation in value. The data was obtained through a questionnaire to assess the habit of using sunscreen and severity of melasma. Data was collected according to the inclusion criteria with a simple random sampling technique.

Results

This research was conducted online involving 31 respondents who met the inclusion and exclusion criteria. All respondents involved were female with different age gaps.

1. Sunscreen Application

From table 1, it was found that 45.2% of respondents use sunscreen regularly and 54.8% were irregularly. So that some respondents have bad behavior in using sunscreen.

Table 1: Use of Sunscreen

Sunscreen Application	Number of Respondents (n)	Percentage (%)
Regular	**14**	**45,2**
Irregular	**17**	**54,8**
Total	**31**	**100**

2. The severity of melasma

Table 2 describes the number of respondents who have mild melasma 74.2%, moderate melasma 22.6%, and 3.2% have severe melasma.

Table 2: Severity of Melasma

Melasma Severity Degree	Number of Respondents (n)	Percentage (%)
Mild	**27**	**74,2**
Moderate	**3**	**22,6**
Severe	**1**	**3,2**
Total	**31**	**100**

Based on statistical tests in table 3, it is known that respondents who have good sunscreen usage habit have mild melasma 35.5%, moderate melasma 9,7%, and there are no respondents has severe melasma. Whereas, irregular sunblock influenced the severity of melasma. As many as 38.7% have mild melasma, moderate melasma 12.9%, and 3.2% have severe melasma.

Table 3: Cross-tabulation of sunscreen application with severity of melasma

			Melasma			Total
			Mild	Moderate	Severe	
Sunscreen Application	**Regular**	**Count**	**11**	**3**	**0**	**14**
		% of Total	**35,5 %**	**9,7 %**	**0 %**	**45,2 %**
	Irregular	**Count**	**12**	**4**	**1**	**17**
		% of Total	**38,7 %**	**12,9 %**	**3,2 %**	**54,8 %**
Total		**Count**	**23**	**7**	**1**	**31**
		% of Total	**74,2 %**	**22,6 %**	**3,2 %**	**100 %**

Based on the lambda test, it is known that the significance value is 0.000 (p value <0.05). Therefore, Ho is rejected and H1 is accepted. It can be concluded there are significant relationship between use of sunscreen and severity of Melasma.

Table 4: Data Analysis

value	Assymptomatic Standard Error[a]	Approximate T[b]	Approximate Significance
.438	**.092**	**3.915**	**.000**

Discussion:

Based on the statistical calculation, 54.8% of respondents have bad sunscreen usage habit, while 45.2% use sunscreen regularly. This can occur due to lack of knowledge how to use sunscreen properly and correctly. Sunscreen must re-apply every 2-4 hours in areas that are frequently exposed to the sun such as the face and neck and also leave the sunscreen at least

10 minutes before doing activities/exposed to UV rays.

Moreover, it was found that 74.2% respondents had mild melasma, 22.6% had moderate melasma, and 3.2% had severe melasma. The severity of disease can be influenced by internal and external factors. Internal factors that affect the severity of melasma such as genetic and hormonal factors, whereas external factors such as UV rays. Several factors may affect the severity melasma to tends to be mild such as not pregnant woman (hormonal factors) and lack in outdoor activities during the pandemic, which is an average of < 3 hours.

Chi Square test showed p = 0.001 (p value<0.05) which means that there is a relationship between the use of sunscreen and the severity of melasma in women of reproductive age. These results are supported by another study which showed that there was a relationship between the use of sunscreen and the severity of melasma (Putri, 2017).

External factors or internal factors may have their own role in influencing the severity of the respondent's melasma. This study took place during pandemic so respondents were often in their homes and rarely had contact with external factors that could increase the severity of melasma. Various internal factors such as genetic and hormonal factors can also affect the severity of melasma in each individual.

The results of this study are also in accordance with the theory which states that sunscreen can provide protection or prevention against melasma through protect the skin from UV rays by scattering and binding keratinocytes due to UV radiation (Seite and Park, 2013).

Compared with previous studies, smaller total number of respondents in this study might influence the results of the study to conclude the relationship between sunscreen use and the severity of melasma. Besides, in this study data collection was carried out online might reduce the level of specificity of the results due to diagnosis was made based on questionnaires and did not see the patient directly.

Thus, some of the above evidence can be used as a consideration about sunscreen application and severity of melasma is relevant and need for further studies on the variables related to the behavior of using sunscreen and severity level of melasma.

Conclusion:

Based on the results of research and data analysis, as well as the discussion that has been carried out, it can be concluded that all 31 respondents have melasma. Most of these respondents had mild melasma severity, as many as 27 respondents (74.2%) of 31 respondents. Some respondents were also stated to have bad behavior in using sunscreen, which was 54.8%. In addition, there was also a relationship between the use of sunscreen and the severity of melasma in women of reproductive age (p=0.001).

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Zuhri, Z. Hubungan Antara Status Gizi Dengan Prestasi Belajar Siswa Madrasah Ibtidaiyah *Fahmi Kelurahan Tambak Wedi Kecamatan*. *Kenjeran Kota Surabaya Tahun Pelajaran 2018/2019.* Universitas Hang Tuah Surabaya.2019

ORIGINAL ARTICLE

An Evaluation Study of Kampung KB in Denpasar City with Working Partners

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ABSTRACT

Background: The National Population and Family Planning Agency (BKKBN) is a non-ministerial institution. The problem is that there is stagnation in program achievements and the weak implementation of the KKBPK Program. The BKKBN established the Kampung KB as a strategic innovation for the full implementation of the KKBPK Program.

Methods: The goal is to know the evaluation of the establishment and implementation of the Kampung KB as a miniature family planning program, grounding, bringing services closer, actualizing 8 family functions, revitalizing KKBPK. Since it was launched in 2016, it has never been evaluated, the criteria for establishing, using Family Data Collection, participation, implementation of regional and cross-sectoral Government commitments, forms of activity, coaching and mobilization, support for facilities and infrastructure, achievement of indicators, knowledge and community participation.

Result: Quantitative studies in-depth interviews are input, process, implementation, monitoring, evaluation, reporting and achievement of program success indicators.

Conclusion: Careful planning so that the program runs effectively, emphasizes the quality of the Kampung KB according to the input and process, not only the quantity target. The program must refer to the needs of the community, so an analysis of community needs is important before determining the program.

Medical and Health Science Journal

Introduction

The Kampung KB program is expected to be a "miniature family planning program" at the lowest level and prioritized for poor areas, densely populated and lacking access to health services. Kampung KB is also designed as an effort to ground the family planning program to bring closer access to services to families in actualizing the 8 family functions and as an effort to revitalize the KKBPK program. Since the Kampung KB was declared in every provincial district in 2016, it has never been evaluated starting from the declaration stage to the implementation stage of Kampung KB. In general, this study aims to determine the implementation of Kampung KB. In particular, to determine the suitability of the criteria for the establishment of the Kampung KB, the extent to which the use of data sourced from the Family Data Collection (PK) in the Kampung KB area, the participation and commitment of local and cross-sectoral Governments in the implementation of the Kampung KB Program, the existing forms of activities, guidance and mobilization by managers programs, support for facilities and infrastructure in the Kampung KB, achievement of program indicators, knowledge and community participation related to activities and programs.

The research framework for the evaluation study of Kampung KB uses a systems approach, where success can be seen from the success of the input, process and output aspects. The input aspect is indicated by the support of human resources (proportionate number of PLKB/PKB); availability of demographic data, family planning data, socio-economic data, data on family members/individual data and other data; Availability of operational facilities, both contraceptives and other supporting facilities, such as: KKBPK KIE media (banners, back drop, banners, Family Planning Information Unit Car, Family Planning Service Unit Car; availability of operational support (budget) for the KKBPK program from the APBD and APBN as well as other sources. other funds, such as: PNPM, Kampung Fund Budget (ADD), Family Hope Program (PKH), Jamkesmas or Jamkesda, where this budget assistance is not only intended at the time of declaration but for the sustainability of activities in the Kampung KB; The existence of regulations/policies from the local government and stakeholder commitments related to the implementation of Kampung KB Furthermore, the success of the Kampung KB program Process aspects: training related to Kampung KB; utilization of PK data and other cross-sectoral data; Kampung KB working group meetings including cross-sectoral coordination meetings (agencies) government and private) which can be in the form of workshops, mini-workshops at the sub-district and Kampung levels; workshops with the community akat; home visits; coaching as well as monitoring and evaluation, both carried out before the declaration and carried out routinely after the declaration. Evaluation of meeting activities will be seen from the number of times the meetings are held, where, who the participants attend and what the results of the meeting/rehearsals are. Aspects of output, the success of the Kampung KB study is marked by an increase in the achievement of the KKBPK program and an increase in the achievement of other related sector programs, by comparing the data before and after the declaration of the Kampung KB. Indicators of achievement of other sector programs, can be different between Kampung KB areas, this really depends on which program focus is the most priority to improve the quality of life of the people in the Kampung. It is hoped that this research can provide input and consideration for policy makers, to improve the development of the implementation of Kampung KB.

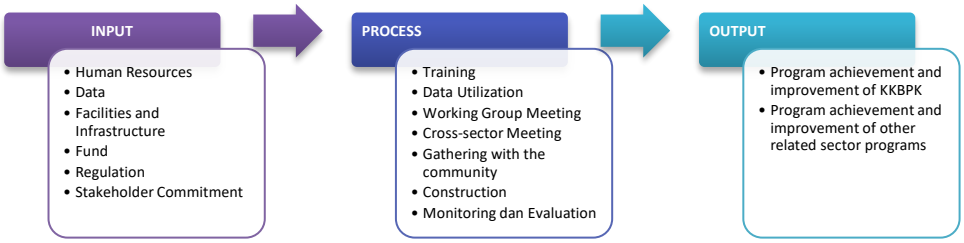

Figure 1.4. Operational framework of evaluation studies of Kampung KB

Methods

This study is an evaluative study with data collection carried out through a qualitative approach as a whole with in-depth interviews from various informants which aims to obtain in-depth information about the inputs, processes, outputs of implementation, monitoring, evaluation and reporting as well as the achievement indicators of the success of the Kampung KB Program involving various cross-sectional areas. sector, local government, TOGA/TOMA, Kampung KB managers and community participation.

Location

Research sites. The Family Planning Kampung Evaluation Study for the Province of Bali was conducted in Denpasar City. The research locus is located in Dusun Wanasari, Dauh Puri Kaja, North Denpasar.

Analysis

Collecting qualitative data through primary data will be analyzed by processing the data from the transcripts of the informants' interviews. In addition to primary data, this study also uses secondary data obtained through processing family data from the 2015 Family Data Collection (PK). The PK data provides additional information from primary data obtained through structured questionnaires so as to validate the results of family data collection and primary data collected.

Data collection was carried out from August to the first week of October 2017. Furthermore, data analysis was carried out in the second week to the fourth week of October 2017. After the data analysis, the results were presented by the Research Team.

Results

This study is an evaluative study with data collection carried out through a qualitative approach as a whole with in-depth interviews from various informants which aims to obtain in-depth information about the inputs, processes, outputs of implementation, monitoring, evaluation and reporting as well as the achievement indicators of the success of the Kampung KB Program involving various cross-sectional areas. sector, local government, TOGA/TOMA, KB village managers and community participation.

Table.1 Details of Respondents/Informants per District/City and Province

Respondent	Per District/City
Responden Kualitatif dengan Wawancara:	
- Perwakilan BKKBN Provinsi	7 org
- OPD KB Kab/Kota	4 org
OPD Lintas Sektor Lainnya	
- Bapeda	1 org
- Dinas Kesehatan	1 org
- Dinas Sosial	1 org
- Dinas Pemukiman	1 org
- Dinas Pendidikan dan budaya	1 org
- Dinas Lingkungan Hidup	1 org
- Dinas kependudukan dan pencatatan sipil	1 org
Perangkat Kecamatan, Desa/Kelurahan, RW:	
- Camat	1 org
- Kepala Desa/Lurah;	1 org
- Ketua RW;	1 org
Tenaga Penggerak	
- PLKB/PKB)	1 org
- Kader (minimal 4 org)	4 org
Pengurus Kampung KB	
- Ketua Kampung KB	1 org
- Ketua PKK	1 org
- Tokoh Masyarakat/Tokoh Agama	1 org
- Seksi-seksi	8 org
Total	**87 org**

Discussion

The Kampung KB Evaluation Study is located in Dusun Wanasari, Denpasar City, including Dauh Puri Kaja Kampung, North Denpasar. Northern boundaries; Banjar Lumintang, east; Banjar Puncak Sari, south; Banjar Wangaya Kaja, west; Badung River. The distance from the North Denpasar District Center is around 2 km, while the distance from Denpasar City is around 1 km and the distance from Bali Province (Governor's office) is 2.5 km consisting of 8 RT, with a population of 5,376 people, with male 2,777 men and 2,599 women. The number of existing KK is 1,494 KK. Data on education level: Not yet in school: 420 people, Kindergarten (TK) : 696 people, No/not yet finished elementary school: 74 people, Junior high school graduates: 547 people, High school graduates: 626 people, Higher education: 130 people. The number of Pre-KS and KS-1 (poor) is above the average of Pre-KS and KS-1. Kampung/Kelurahan Level or as many as 18 KK. Of the total PUS of 1,236 people, only 709 people are PUS who are active family planning participants due to lack of public knowledge in family planning participation and low participation in Tri Bina Plenary activities, including in urban poor areas, high population density. , and is included in the Watershed (DAS). Most of the population works in the Trade Services sector.

Qualitative data was collected at three levels, namely: Province, Regency/City, and Kampung/Dusun with group interviews with a number of informants. Primary data were obtained from in-depth interviews and focus group discussions (FGD) which were conducted by analyzing the results of interviews with predetermined respondents. FGD Respondents (Form 1) : Head of Bali Province BKKBN Representative, Head of Family Planning Division, Head of KS Division, Head of ADPIN Division, Regional Apparatus Organization for Family Planning (OPD KB Denpasar), OPD of other related sectors (Dukcapil Denpasar, Denpasar Health Office, Denpasar Social Service) , and Respondents. In-depth interviews: Head of the Bali Province BKKBN Representative, Denpasar PLKB, Kampung Apparatus, Cadre, Wanasari Kampung KB Manager, while group interviews include: Form 2 OPD to the Head of Population Control, Counseling, and Mobilization, City P3A-PPKB Office Denpasar, Form 3 PKB to PKB, Form 4 Cadres to two cadres, Form 5 Kampung KB Management to the Head of Dusun Wanasari as a Community Leader, Form 6 Kampung Apparatus to the Kampung Head Dauh Puri Kaja, East Denpasar, Form 7 OPD Other Sector, namely Dinas Denpasar City Population and Civil Registration, Denpasar City Social Service, Denpasar City Health Office.

a. Input Aspect. The basis for the formation of the Kampung KB: not all respondents understand the basis for the formation of the Wanasari Kampung KB in Denpasar. In the ranks of representatives of the Bali Province BKKBN, most of them know and understand the basis for the formation of Kampung KB, but not in the ranks below them. The process of establishing a Kampung KB: not all respondents know the process of forming a Kampung KB. Only representatives of the Bali BKKBN, Denpasar KB OPD, and Cadres. There is information that is disconnected from Cadres, Kampung Apparatuses, Kampung KB administrators, and other related OPDs. The criteria for the formation of Kampung KB were only known by respondents at the Provincial, Regency and PLKB levels, while most of the other respondents did not know for sure what the criteria for the establishment of Kampung KB were. Availability of supporting documents for Kampung KB Activities (guidelines, guidelines, operational guidelines, technical guidelines, instructions, circulars, etc.) to implement the program in Kampung KB. Most of the respondents said they did not have supporting documents for Kampung KB activities. The document was stopped at the Kampung level and was not followed up again. There is use of 2015 PK data, although not all ranks related to Kampung KB understand the use of 2015 PK data for the Kampung KB program. Sources of funds and their allocation in the process of establishing Kampung KB come from various different sources, such as: APBN, APBD, APBDes, ADD. The Kampung KB Working Group has not yet been formed, because there is no SK Kampung KB so that the organizational structure and management of the Kampung KB does not yet exist. There is no cross-sectoral OPD involvement in Kampung KB activities, because there are no activities or programs that clearly involve cross-sectoral involvement. Involvement in Kampung KB (Camat, PLKB, Cadre, etc.). The Pokja Kampung KB is not running, there are no activities, because there is no clear program. There is a difference in answers between the Province and Denpasar City OPD regarding commitment. According to OPD KB, there is no cross-sectoral commitment, due to unclear information on Kampung KB. It is not known that there are integrated activities

between KKBPK and cross-sector. There is no discussion about Kampung KB yet. Kampung KB funds come from various sources (APBN, APBN, ADD/APBDes, etc.), but only at the time of socialization/establishment, temporarily because there are no activities/work programs in Kampung KB so the funds do not yet exist.

b. Process Aspect. The training/socialization of the Kampung KB in Wanasari Denpasar Dusun had been carried out before and after the declaration of the Kampung KB, but it was not felt until the ranks of the Kampung KB below. There is use of Family Data Collection (PK), which is updated/updated (1-5 years), but in Kampung KB this does not exist. There is no POKJA KB meeting, because there are no programmed activities in this Kampung KB. There has been no meeting / workshop that discusses the specifics of Kampung KB, because there are no activities and there is no Kampung KB program. There is monitoring carried out by the Bali Province BKKBN, but Evaluation, Recording, Reporting does not exist because in Kampung KB there are no organized programs and activities.

c. Output Aspect. Activities in Kampung KB have not run as they should, because there is no understanding of the program in Kampung KB. The existing activities carried out in Kampung KB are more for health programs from posyandu and Kampung, not specific activities for Kampung KB. Based on Secondary Data According to the Matrix of Needs. The number of Pre-Prosperous Families (KPS) and Prosperous Families (KS) I in Kampung KB before the declaration was 19, after 19, meaning there was no change. Contraceptive Prevalence Rate (CPR) before declaration was 884: 2395 x 100% = 36.9% and after proclamation CPR 941: 2538 x 100% = 37%. This means that out of 100 PUS in the Kampung KB of Dusun Wanasari, 37 were using family planning methods at the 2016 declaration. The use of MKJP at the Kampung KB level increased from 181 to 209 (86%), while Unmet need 171 decreased to 105 (1.6). Based on Secondary Data According to the Matrix of Needs. There are reports regarding the forms of activities carried out in the Kampung KB, but there has been no report on the achievement of targets from across sectors.

Conclusion

1. Indicator: Programs in the Kampung KB Wanasari Denpasar area were not achieved.
2. Input: Human resource support that functions as program officers for the Wanasari Kampung KB program is not optimal. PK data is available, but this data is not understood by almost all Kampung KB apparatus. There are no operational facilities (Contraception, KIE KKBPK). There is no regulation from the local government that supports its implementation. Cross-sectoral commitments are not working as they should.
3. Process: No training. There is no optimal use of PK and cross-sector data. There is no POKJA meeting activity. There are no cross-sectoral coordination meetings (government and private agencies), workshops, sub-district and Kampung mini-workshops, workshops, home visits. There is no coaching because there are no activities. There has never been monitoring and evaluation because there are no activities/programs in Dusun Wanasari.
4. Output: There was no effective increase in the achievement of the KKBPK program and an increase in the achievement of other cross-sectoral programs in Dusun Wanasari.

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Conflicts of Interest

There are no conflicts of interest declared by the author.

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ORIGINAL ARTICLE

Usage Of Vitamin D Supplements During Covid19 Pandemic In Baghdad City, Iraq

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ABSTRACT

Background: The aim of the current study is to determine vitamin D supplement usage among adults living in Baghdad city, Iraq during COVID19 pandemic.

Methods: A cross-sectional study was conducted among 480 adults living in Baghdad city, Iraq through convince sampling. An online administered questionnaire was used to collect the data from respondents.

Results: Around two-thirds of respondents used Vitamin D supplements (65%). There was a significant association between taking Vitamin D3 supplements and educational level, getting COVID19 infection with P value of (0.01, <0.001, <0.001) respectively.

Conclusion: As a conclusion, two-thirds of our study respondents took Vitamin D supplements during COVID19 pandemic. More education is needed for population about the use of vitamin D in boosting immunity and preventing infections.

Medical and Health Science Journal

Introduction

The world is presently encountering its third significant scourge of Covid (CoV) contaminations. Another CoV contamination pestilence started in Wuhan, Hubei, China, in late 2019, initially called 2019-nCoV[1] and renamed Coronavirus by the World Wellbeing Association on February 11, 2020. Past CoV pandemics incorporate extreme intense respiratory disorder (SARS)- CoV, what began in China in 2002 [2], and the progressing Center East respiratory condition (MERS)- CoV in the Center East, first detailed in 2012.[3]
A few audits consider the manners by Vitamin D has numerous systems by which it diminishes the danger of microbial disease and demise. A study with respect to the job of vitamin D in decreasing the danger of the regular virus assembled those instruments into three classes: actual boundary, cell common invulnerability, and versatile resistance [4]. Vitamin D supplementation additionally upgrades the outflow of qualities identified with antioxidation (glutathione reductase and glutamate–cysteine ligase modifier subunit).[5]

A recent study relates to the role of vitamin D in reducing the risk of developing a cold by grouping these mechanisms into three categories: physical barrier, adaptive immunity, and cellular natural immunity. [4] Adherent junctions, narrow junctions, gap junctions. (For example, by E-cadherin).[6] There is many research looking on how to damage the integrity of the connections, leading to an increase in infection with the virus and other microorganisms.[7]

Aim of the current study is to determine vitamin D3 supplement usage among adults in Baghdad city.

Methods

A cross-sectional study design was conducted among 480 adults living in Baghdad city, Iraq. The study period was from February till August 2021. The questionnaire consisted of 17 questions, and it consisted of three parts, where the first part include social and demographic questions (age, gender, marital status, occupation and educational level), and the second part includ questions related to Covid 19 infection (have you had Covid 19 infection before, in which A month I contracted Covid, how many days did the infection last, did you use medication, did you take preventive measures), and the third part included questions about vitamin D (did you take a blood test to find out the level of vitamin D, 19- Have you ever taken nutritional supplements or multivitamins that Contains Vitamin D During the COVID-19 Pandemic How Long Have You Been Taking Vitamin D Motivation to Start Taking Vitamin D.

The inclusion criteria were adults living in Baghdad city Iraq who are willing to participate in the study while exclusion criteria were people who do not want to participate, People with mental problems. Sampling method is convenience sampling (non-probability).

Participation in the study is on voluntary bases. Consent was taken from all the respondents. The details will be used for research purpose only. Ethics approval was taken from college of Nursing, Al-Bayan University

Statistical Analysis

Data collected was analysed using Statistical Package of Social Science (SPSS) version 24.0 Mean an SD was used for numerical variables while frequency and percentage for categorical variables, chi square test was used to test association between variables.

Results

A total of 480 adults between the ages of 18 and 56 participated in the study. Table 1 describes demographic data. The percentage of female participants in the study was greater than males, (59.8%). As for the social situation, the percentage of unmarried people was (64.2%), while the percentage of married people was (32.3%). As for the job, the percentage of students was greater than the employees, which amounted to (42.9%), while the percentage of employees in the government sector was (37.9%).

Table 1: Socio-demographic characteristics of the respondents

	N	%
Gender		
Male	287	59.8
Female	193	40.2
Marital Status		
Married	155	32.3
Single	308	64.2
Divorced	17	3.5

Occupation		
Housewife	18	3.8
Student	206	42.9
Government Worker	182	37.9
Private Sector Worker	16	3.3
Unemployed	58	12.1

	Min	**Max**	**Mean**	**SD**
Age	18	57	26.55	6.334
How long infection last	1	60	13.79	8.092

Table 2 shows descriptive statistics, where it is mentioned that the minimum age of the participant in the study is (18) years. The oldest participants in the study are 57 years old, with a mean age of (26.55) years. The table also shows that the percentage of university students was more than high school students, where the percentage of university students participating was (50.8%,) while the percentage of high school students was (31.9).

Table 2: COVID 19 infection & management history

Did you get covid19		
	N	**%**
NO	269	56.0
YES	211	44.0
Which month got infected in 2020		
March	25	5.2
April	19	4.0
May	18	3.8
June	19	4.0
July	31	6.5
August	18	3.8
September	24	5.0
October	22	4.6
November	19	4.0
December	16	3.3
Admission to hospital		
no	188	39.2
yes	23	4.8
Use medication		
no	28	5.8
yes	183	38.1
Use anticoagulant		
no	169	35.2
yes	42	8.8
Use antibiotics		
no	54	11.3
yes	157	32.7
Family member infected		
no	276	57.5
yes	204	42.5
Family member died		
no	461	96.0
yes	19	4.0

Table 3 shows the descriptive statistics of COVID 19. The percentage of people who were not infected with Covid19 was higher than the infected people, as the percentage of healthy people who were not infected was (56.0%), while the percentage of infected people was (44.0%). As for the period of infection, the rate of infection in the month (7) was the highest, reaching (6.5%). As for the people who were admitted to the hospital and who were not admitted, the percentage of people who did not go to the hospital was more than those who were admitted to the hospital, where their percentage was (39.2%). As for people who took medical treatment, their percentage was (38.1%), which is more than those who did not take medical treatment (5.8%). As for people who took anticoagulant, their percentage reached (5.8%), which is much lower than those who did not take anticoagulant, their percentage reached (35.2%).

The proportion of people who took antibiotics was higher (32.7%) than those in the study who did not take, while the proportion of people who did not take antibiotics (11.3%).

The percentage of answers to the question: Was a family member infected, the answers were the most? No family member was injured, where it was (57.5%). As for the answers about the death of a family member, the most answers were (96.0%) that no family member died.

Table 4: Prevention control after infection & Vitamin D

Safety after recovery		
	N	**%**
NO	55	11.5
YES	425	88.5
Wearing the mask		
NO	70	14.6
YES	410	85.4
Hand washing		
NO	46	9.6
YES	434	90.4

VITAMIN D Blood test		
NO	324	67.5
YES	156	32.5
Vitamin D Supplements before		
NO	168	35.0
YES	312	65.0
Vit. D dosage		
Do not know	136	28.3
1000 IU	57	11.9
2000 IU	29	6.0
5000 IU	90	18.8
Vit D usage motivation		
Internet	89	18.5
Doctor Advice	149	31.0
Friend	54	11.3
Family Member Takes It	20	4.2

Table 5: Association between gender, Covid-19 factors and Vitamin D Supplements usage

		Vitamin D Supplements usage		P value
		No	**Yes**	
		N (%)	**N (%)**	
Gender	Male	112 (39.0)	175 (61.0)	0.024
	Female	56 (29.0)	137 (71.0)	
Did you get covid19	No	122 (45.4)	147 (54.6)	**<0.001***
	Yes	46 (21.8)	165 (78.2)	
Family member infected	No	117 (42.4)	159 (57.6)	**<0.001***
	Yes	51 (25.0)	153 (75.0)	
Family member died	No	166 (36.0)	295 (64.0)	0.022
	Yes	2 (10.5)	17 (89.5)	

*chi square test was performed, level of significant at p <0.05

Overall, these data refer to the use of prophylactics and vitamin D3 in the daily lives of college students. As for the use of prevention and wearing a mask, the acceptance rate was significant (85.4%). The rejection rate was very low (14.6%) As for the students who used vitamin D3 and were not infected with the Covid 19 virus, the percentage reached (65.0%).

Discussion

The main findings of the current study are that two-thirds of the respondents took Vitamin D supplements during COVID19 pandemic in Baghdad city, Iraq. The results showed that the percentage of people who took vitamin D before infection with Covid 19 was (65.0%), where the percentage of males (61.0%) who take vitamin D more than females. These results are consistent with a study by [8](Annweiler et al., 2020). In the intervention group, 82.5% (n=47).

Our results were supported by previous studies that multivitamin supplements are quite prevalent (64.2%) in the community of urban areas of Bikaner. Our findings are quite comparable with those of a National Health and Nutrition Examination Survey.[9,10] Likewise, a study conducted by Reinert et al. reported that about 40% of the population were consumers of vitamin or mineral supplements.[11] The results also showed the respondents' high knowledge of preventive measures, namely wearing a mask and using sterilizers, in addition to the relationship of vitamin D3 with social and occupational status, the results showed that the percentage of unmarried people was higher than non-married people (62.7%).

As for the job relationship, the percentage of the housewife in taking vitamin D3 was more (83.3%). As for education and its relationship to vitamin D3, as we previously explained that the percentage of knowledge most is among university students (70.5%). The results also showed the number of COVID-19 cases where the percentage of injuries for those who took vitamin D3 (54.6%) was lower compared to people who did not take vitamin D3, and this confirms the role of vitamin D3 in preventing Covid 19 disease. (P value < 0.001). As for the familial deaths who took vitamin D3 as well, it was low compared to the people who did not take vitamin D3 before infection.

Similar to previous studies, in this study also multiple reasons were mentioned by the participants for using vitamin supplements.[12] In our current study, most of the respondents received knowledge about the multivitamin supplements from their physician (31.0.%). This finding is in accordance with the research by (Guraya, 2018)[13] who concluded that knowledge about the multivitamin supplements from their physician with (54.8%).

Conclusion

As a conclusion, Two-thirds of our study respondents took Vitamin D supplements during COVID19 pandemic. People at high risk of developing vitamin D deficiency during this pandemic should consider taking vitamin D supplements. More education and promotion are needed to educate people on the importance of Vitamin D in enhancing the immunity and prevent infection. We recommend that future studies to be performed in other Provinces of Iraq and not only in Baghdad and also to focus on COVI19 patients and whether talking Vitamin D had benefit them.

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Conflicts of Interest

There are no conflicts of interest declared by the author.

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REVIEW ARTICLE

A Brief Review of Beneficial Effects of Yoga on Physical and Mental Health

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ABSTRACT

Yoga is focussed as an essential form of spiritual discipline based on an extremely subtle science bringing harmony between mind and body. It is an art and science of healthy living consisting largely of asanas. It is found to be one of the best exercises for physical and mental health. There is more need of supportive therapy for maintaining physical and mental health apart from current treatment by different forms of medicine. It is known to relax body, promote immunity and thereby prevent illness seeing as effective, acceptable and cost-effective for body and mind to relieve stress. An online search for studies done using medline terms like yoga, physical health & mental health were done. The studies have shown that it improves physical illness and promotes mental calmness by removal of anxiety, depression & stress thereby excel the treatment of diseases. These gives positive change such as well-being and happiness to the individual and increase the quality life years.

Medical and Health Science Journal

INTRODUCTION

Yoga is word derived from Indian philosophy which is related to physical exercise and postures. Yoga exercise not only relax or gives flexibility to mind and body but removes stress, gives strength and breathing deepening in yoga along medication removes anxiety and depression[1]. Other benefit is to it gives fitness to body by regulating BP, mood and metabolism[2]. Yoga has therapeutic effects mainly in respiratory, cardiovascular and psychiatric disorders[3]. Yoga has therapeutic effects on body which gives positive effects on physical and mental health.

Yoga is an exercise of postures that improves physical and mental health. Anxiety and depression are largest contributor of disease after ischemic heart disease. Yoga is as therapeutic to prevent illness and promote mental well-being. Mental health improvement approaches the roots of problem and help to prevent diseases [4-6].Yoga prevents diseases and treat anxiety and depression and brings mental health balance.

Yoga

Yoga is word from Sanskrit having paths

1.Moral codes

2.Self-discipline

3.Postures

4.Breath practice

5.Concentration

6.Sensory transcendence

7.Meditation

8.State of bliss

Yoga is best practice in Asia to join mind and body to promote physical and mental health collectively [7].Yoga is exercise which has interconnects and union in life[7] Yoga practice is in world because of its benefits and linked because it has therapeutic effects [8].Yoga is physical exercise which has aim to union in life [7].Yoga is an individual practice that anyone can perform and has positive social interactions. It is performed because of low cost and to get peace and healthier body.

Yoga and mental health

There are many studies on yoga because of its benefits from medical services. The benefits of current research on yoga have brought peace and improves mental health. Different researches are performed on concentration, exercise, self-discipline, position and conclude it to be best to improve mental health and prevent disorders by giving inner satisfaction. Few studies have shown that performing yoga regularly under trained guru has improved mental health and better health randomly[9].

Figure 1: Benefits of Yoga on mental Health

Copyright: vocal.media/longevity/importance-of-yoga-for-mental-wellness

A study has found Yoga practice of quieting the mind[10]. A sound mental health can permit all to participate in curricular activities, can face stress, learn his or her abilities ,can get inner peace, can work better and contribute in every field of life[11]. Currently, research is going to perform on improving the mental health and life quality by preventing disorders.

These are four publications on therapeutic effects of yoga in diminishing depression[6, 12] and one is breathing deeply in yoga[13] and one summary[14]. Researchers have found depression caused from various sources, its elevation and its increasing symptoms in everyday life. Many researchers have shown that yoga removes the symptoms of depression from people. In comparison to other exercises yoga actively control depression[12]. Yoga practices brings change in neurotransmitter chemicals by electrophysiological changes and removes depression mainly by GABA[6, 13]. This also has found to alleviate fatigue in healthy people and those who are suffering from asthma, sclerosis, cancer, fibromyalgia, dialysis and pancreatitis[15]. Along with medication, yoga has seen to have therapeutic effects in decreasing anxiety in a study.[1]

Yoga has beneficial effects in treating anxiety and trials have been performed in which it is shown to be beneficial in diminishing anxiety which yoga fulfil criteria[16]. It also removes posttraumatic stress disorder. Studies have shown that it has helps in diminishing stress, sadness, disturb sleep and anxiety[17].

Yoga and physical fitness

Yoga practise is one of best exercise which keeps body fit even in old age. Studies have shown that yoga gives fitness physically with respect to balance, body relaxation, function, strengthening body and weight loss[18]. In yoga along with physical fitness, yoga brings inner calm, improves function, abilities positively and self-confidence in adults. It also improves social involvement and self-esteem. It has effects in physical fitness by sympathetic and parasympathetic activation and vagal nerves. Yoga shifts sympathetic to parasympathetic system by releasing hormone or neurotransmitter by vagal stimulation[19]. It is reported that yoga gives strength to muscles of heart[20].

Effect of yoga on life

Yoga has one of best to improve quality of life in healthy and ill both people by decreasing fatigue, anxiety and depression. In comparison to other forms of exercise, yoga has more benefits by alleviating depression & stress, also benefit for cardiorespiratory function and in patients of mood disorders[21].

Figure 2: Health benefits of Yoga

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Many forms of treatment by medicine has toxic side effects but yoga has no side effects but also enhance the quality of life[22]. Yoga also improves physical and mental health in prison[23]. Yoga is best to improve health of women during pregnancy and help to cope in sexual relationship by strengthening muscles[24]. It removes stress, depression in breast cancer therapy[25] and also improves health in other people who are not psycho[26]. Yoga is used as adjunctive therapy[27]. A study has found supportive role of Yoga benefitting to help in treatment of depression[28] It is equal to antidepressants [29]. Yoga and antidepressants along are more beneficial[30].

Yoga experience

Patient feels good after practising yoga and use it positively. It motivates patients by removing stress, depression and they cope with their abilities which improves their performance.

Yoga effects on body

Yoga has one important impact on body is prevention of diseases, removing anxiety and depression, promoting health both physically and mentally. It has also an effect on heart, respiratory system and brain and it gives inner peace to fight with stress and keep calm. When it effects on brain it stimulate GABA(Gamma amino butyric acid) by parasympathetic system which are affected by vagal nerves[31]. Yoga by breathing & postures, body movement is found to be best among patients with cardiac illness. Yoga gives positive expressions in immune cells[32]. In yoga, breathing is slow which acts as link between body and mind to give relaxation to body which acts on principle of yoga. Slow and deep breaths fulfil the body needs of oxygen. It gives relaxation and stability to mind and body and improves mental health and function. Yoga by relaxing mind gives relaxation to body effectively and it helps to decrease mood disorder, depression, stress, anger and gives inner satisfaction and happiness. Many of the postures are like tree, snake, animals like cat, dog etc[33]. One of best pose is corpse pose in which limbs are relax by lying down as deep rest. Yoga-practice in schools, colleges, workshops and health care is best to promote physical and mental health of people[34].

Yoga and cardiopulmonary system

It is reported that yoga practicing help in controlling BP or hypertension in which it is studied that it lowers both systolic and diastolic blood pressure [19].One research conclude that yoga lowers both systolic and diastolic blood pressure in without comparing to medicine treatment[35]. Yoga helps in improving lung function in patients of asthma and bronchitis because of deep breathing[20].

Yoga and metabolic syndrome

Yoga practicing has effect on insulin resistance syndrome which it has effect in controlling glucose [19]T2 diabetes mellitus[36] and its management which it can control glucose level for short term not for long term[37]. It is treated by duration of yoga from 20 min to varying session from 3-5 days for 90 min and it has beneficial therapeutics effects. Yoga studied evidence that it has menopausal effect which is insufficient[38]. In menopausal symptom yoga has effective intervention in psychiatric, urogenital, vasomotor and somatic symptoms [39]

Yoga and musculoskeletal condition

Yoga practising is beneficial in physical fitness and relaxation of muscles which treats pain. Researches are performed on function of muscles[40, 41]and on chronic pain[42, 43]including lower back pain and joints pain or arthritis. Studies concluded that yoga is favourable in treating pain like headache, migraine, backache, arthritis and labour pain.

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REVIEW ARTICLE

Extremely Low Frecuency (ELF) Electromagnetic Radiation Potential to Accelerate Fracture Splicing

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ABSTRACT

The treatment process for healing fractures in the community is still mostly done through traditional methods, which are generally referred to as "sangkal putung". The results obtained 28.2% cannot return to its original form. In the process of denying putung it still takes quite a long time depending on the part of the bone that has broken. This study aims to reveal the potential effect of exposure to the ELF (Extremely Low Frequency) magnetic field on the fracture healing process. This research method uses an article review, with a total of 30 articles from relevant research articles from 2000 to 2022. This aims to examine the effect of effective treatment of the intensity of exposure to the ELF magnetic field on the fracture healing process. The results showed that there were 73.3% of researchers who supported the ELF EM wave was able to accelerate the splicing of fractures. Meanwhile, 26.67% of researchers did not support it. The results of the study reported that exposure to a magnetic field with an intensity of 120μT-200μT was able to increase the proliferation of osteoblast cells so as to heal fractures. The most accurate range of intensity in the process of forming Osteoblam cells is the intensity of 150μT. The results in experimental animals showed that exposure to the ELF magnetic field had an effect on the process of forming osteoblasts completely. The results of clinical research (bone fracture patients) showed that exposure to a magnetic field with an intensity of 150μT was able to form and secrete organic collagen and non-collagen in Osteoblast cells, while ELF Osteoclast cells were able to assist in the reabsorption of existing bone cells. Based on the results of the analysis, it can be concluded that exposure to the 150μT intensity ELF magnetic field has the most optimal ability in the process of forming osteoblasts (osteoclasts and osteosts) in fracture healing.

Medical and Health Science Journal

Introduction

Fracture or commonly known as a fracture is a condition where the bone breaks, cracks or breaks so that it can change its shape.[1] Fracture itself can be regarded as a complete or partial loss of bone continuity. Fractures can occur because the bone receives pressure or impact whose strength exceeds the strength of the bone.[2] The cause of fractures is accidents, both minor accidents and major accidents. But apart from being affected by accidental fractures caused by pathology and imperfect degenerative processes in the bones.[3] One of them is osteoporosis, where in this condition the bones experience a decrease in minerals and damage to the micro components of the bone and have an impact on increasing the risk of fracture.[4] In general, fractures can be divided into two, namely closed fractures (bone fragments do not penetrate the skin) and open fractures (bone fragments have a relationship with the outside world such as wounds to the skin or soft tissue).[5]

Fracture conditions (broken bones) are one of the major problems that are often experienced by humans. Fracture healing process must be done quickly and precisely.[6] If the fracture healing process is not carried out with the right process, it will have a very dangerous impact on fracture sufferers, and can even cause new diseases that attack the safety of fracture sufferers.[7] The principles in the treatment of fractures include reduction, immobilization, and restoration of normal bone strength function.[8] Healing fractures traditionally "denies putung" is still the prima donna of society. According to [9] 6.23% on average, both rural and urban communities still believe in the denture-putung method in healing fractures. However, this process will not guarantee that the bone will return to its original state and if this treatment is carried out incorrectly, it will have an impact on the growth of new bone diseases. [10]

Magnetic and electric fields are one source of electromagnetic that can help the modern fracture healing process.[11] One of them is that alternating electric current can produce exposure to an ELF (Extremely Low Frequency) magnetic field with a frequency intensity of 0-300 Hz.[12] Radiation exposure to the ELF magnetic field is a type of non-ionizing radiation that cannot perform induction and absorption processes on the media used. The Extremely Low Frequency magnetic field also has non-thermal properties which cannot produce unobstructed heat.[13] So that the magnetic field can penetrate the network or building. The spectrum of electromagnetic wave radiation is very broad and has a variety of frequencies. One of them is in electrical equipment sourced from PLN, the frequency it has on average is 50 Hz.

Many studies have proven that ELF in the field of fracture healing medicine can help the process of forming Osteoblasts and Osteoclasts. Osteoblasts are cells derived from the supporting tissue of stem cells in bone marrow stomata. In this cell has a very important task that is responsible for the formation and development of bones. According to[14] exposure to an ELF (Extremely Low Frequency) magnetic field with an intensity of 120-200 μT is able to assist in fracture healing. With optimum bone conditions, exposure to ELF can help Osteoblast cells.[15] The system used for exposure to the ELF magnetic field is designed with the 30-120 Hz ELF system proven to be able to reduce the Gap Junction Intercellular communication in the bone development phase.[16] However, not all exposure to ELF magnetic fields affects osteoblast differentiation.[17] So this is what makes it clear that exposure to the ELF magnetic field only helps the process of splicing broken bones.

Based on the description above, the use of the ELF (Extremely Low Frequency) magnetic field aims to reveal the intensity of exposure to the ELF magnetic field which is in accordance with the fracture grafting process.[18] The ELF magnetic field is able to help the process of forming Osteoblast cells so that the process of secreting organic collagen and non-collagen in Osteoblast cells can be carried out quickly and precisely.[19] This has been proven by previous studies, where exposure to a magnetic field for 30 minutes with an intensity of 120μT can increase Osteoblam cells which are able to help heal fractures. With the use of the right intensity ELF magnetic field is expected to maximize the fracture healing process. And can be used as an appropriate alternative in the treatment of fracture healing.

Methods

The type of research design used is descriptive research. The research method used is Article Review by reviewing 30 articles originating from international articles and national articles. Literature searches were carried out by accessing Sciencedirect, Pubmed, Google Scholar and have been indexed by SINTA or Scimago. The search terms used were 'Extremely Low Frequency (ELF), Fractures, Electromagnetic Radiation, Bone Comprising Cells'. What is reviewed from the 30

articles is the intensity of exposure to the ELF (Extremely Low Frequency) magnetic field that is suitable and able to help the process of splicing fractures. This study also examines the effect of exposure to the ELF magnetic field on bone formation cells and the effect of exposure to ELF on the human body.

Result

Characteristic of the Studies

The collection of literature data on Sciencedirect, PUBMED, Google Cendikia and indexed by SINTA or Scimago resulted in 30 articles that had a significant relationship to the results of the reviews carried out. The articles used as literature data are international articles originating from various regions, as well as national articles. Twelve journal articles discuss the effect of long exposure to Extremely Low Frequency (ELF) magnetic fields, four journal articles discuss the intensity of exposure to Extremely Low Frequency (ELF) magnetic fields, and 16 Journal Articles discuss fractures and the process of bone formation.

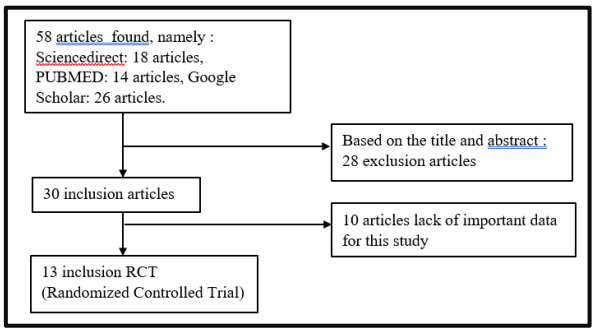

Figure 1. Path Diagram of the Process of Selecting Studies.

Discussion

EM-ELF Exposure Intensity

The results obtained from the source of the review article show that there is a very significant correlation and relationship between the intensity of exposure to Extremely Low Frequency electromagnetic fields and the fracture healing process. However, from these articles there has been no study that explains significantly between the intensity of exposure to Extremely Low Frequency (ELF) magnetic fields for fracture healing.

The results obtained are 6 journals that use therapy with exposure to Extremely Low Frequency (ELF) magnetic fields. Details of the research results are shown in table 1. The results from the 6 journals state different things about the intensity of exposure to ELF magnets. The intensity of exposure to a magnetic field with the right intensity will have a good influence on the formation of bone cells but the intensity given is not right it will have an impact on damage to other body organs. This is in accordance with research from (Agil, M., Ma'arif, B. and Aemi, N. Y., 2019) with the results of research conducted on Balb/C mice with various osteoporosis cases (Akdag, M. Z. *et al., 2010)* giving an intensity of 120 T to Balb/C mice the results were able to increase the proliferation of osteoblast cells so as to heal fractures. In contrast to the research that has been done by (Van Den Heuvel, R. *et al., 2001)* It was found that exposure to an ELF magnetic field with an intensity of 80 mT (50 Hz) showed a reduction in proliferation. According to (Alcaraz, M. *et al.,2014)* Geometric and biomechanical analysis showed that there was a significant decrease in rats exposed to 100 mT-MF compared to rats exposed to sham and 500 mT-MF regarding the value of the cross-sectional area of the femoral shaft (Po0.05). The femoral cortical thickness of mice exposed to MF (100 mT and 500 mT) was also significantly decreased.

Exposure to the Extremely Low Frequency magnetic field has various intensities. The right intensity can help assist in the health sector, but if exposure to EM-ELF is not appropriate, the impact will vary on the human body and other living things. Basically the human body has electric and magnetic fields which have a complex role in controlling the physiological mechanisms of the body. So if there is excessive external exposure, it will cause additional stress to the human body and damage the functions of other organs.

EM-ELF Exposure Time

The results obtained are 4 journals that use Extremely Low Frequency (ELF) as a fracture healing process using a certain length of exposure. The results showed that ELF with an exposure duration of 30 minutes with an intensity of 120μT had a good effect on the formation of osteoblasts in osteoporotic bones. This is in line with research conducted by (Agil, M., Ma'arif, B. and Aemi, N. Y., 2019) which states that intermittent exposure to Extremely Low Frequency magnetic fields 30 minutes, 60 minutes, 90 minutes on the formation of osteoblasts has a different impact, accuracy in bone formation is obtained at intermittent 30 minutes. In contrast to research (Manjhi, J. *et al.,*

2013) Stating that bones with mild osteoporosis can be exposed to an ELF electric field with a duration of exposure of 30 minutes. However, in cases of advanced osteoporosis and fractures, the duration of exposure in the formation of osteoblasts is 90 minutes.

Exposure to Extremely Low Frequency magnetic fields has clinical implications. According to the World Health Organization (WHO), the threshold for exposure to magnetic fields has a clinical impact if the duration of exposure is not in accordance with the condition of the human body.[1] Inappropriate length of exposure has a negative impact on the body, so this threshold still cannot guarantee the biological effect and further research is needed for research to ensure the correct effect of the threshold.[15] Exposure to EM-ELF has nonlinear properties depending on the intensity of exposure and duration of exposure to EM- ELF and the treatment given. So that exposure

To ELF can have a negative or positive impact on its users.[20]

Table 1. Details of Research Results on the Effect of ELF Magnetic Field Exposure

Author	Year	Method	Sample	Intervention	Results
Van Den Heuvel, R. *et al.*	2001	Testing	Male mice and female mice	Male and female mice were grouped by sex and randomly assigned and treated with Extremely Low Frequency magnetic field exposure with an intensity of 80μT (50Hz).	Exposure of murine bone marrow cells, from male and female mice, to an 80 mT (50 Hz) magnetic field showed reduced proliferation. Results on the effect of the ELF field on stem cell proliferation are somewhat equivocal at present. The results from female mice showed a decrease, while those from male mice did not experience a decrease.
Akdag, M. Z. *et al.*	2010	Testing	Mice	Mice were divided into three groups: two experimental and one sham control. The first and second experimental groups (n 10) were given 100 mT and 500 mT-MF for 10 months, 2 ha days, respectively, and the third group (n 10) was treated like the experimental group except for ELF.	Geometric and biomechanical analysis showed a significant decrease in mice exposed to 100 mT-MF compared to mice exposed to sham and 500 mT-MF about the value of the cross-sectional area of the femoral trunk (Po0.05). The maximum load was increased in mice exposed to 100 mT-MF and 500 mT-MF when compared to sham mice (Po0.05). The femoral cortical thickness of the MF-exposed mice (100 mT and 500 mT) was significantly decreased compared to the sham group mice (Po0.05 and Po0.001).
Manjhi, J. *et al.*	2013	Control trial	Adult Male Wistar Rat	Adult male Wistar rats (n = 24) were equally divided into sham, SCI, and SCI+MF groups. Then exposed to EM-ELF (2 hours/day × 8 weeks) (17.96 micro-Tesla, 50 Hz)	This study demonstrated that SCI-induced osteoporosis in rats could be limited by chronic (2 h/day × 8 wk) exposure to ELF-MF (17.96 T, 50 Hz) as expressed by BBB scores, BMC, BMD, mineral elements. content, and biochemical parameters related to sublesional bone.
KiTaek, L. *et al.*	2013	Testing	Eligible patients	Patients who met the trial requirements were divided	ELF-PEMFs can increase cell proliferation and accelerate osteogenesis. In conclusion, these findings may suggest that ELF-

				into 3 groups and then treated with predetermined variables.	PEMFs at appropriate intensities enhance bone formation by promoting stem cell differentiation and maturation.
Alcaraz, M. *et al.*	2014	Control trial, random	Patients were divided into 3 trial groups.	Patients were randomly selected and divided into 3 treatment groups. The treatment that became the control was the group with 50 Hz EM-ELF exposure.	The results showed that 50 Hz ELM-MF increased MNPCE in rat bone marrow, expressing a genotoxic capacity. Administration of antioxidants with genoprotective capacity against damage caused by ionizing radiation acting through free radical scavenging did not reduce the chromosomal damage caused by this ELM-MF.
Agil, M., Ma'arif, B. and Aemi, N. Y.	2019	Trial, Random	Balb/C mice	Balb/C mice were grouped with an intensity of 120μT, and 150μT with an exposure time of 30', 60', and 90'.	The results showed that exposure to a magnetic field with an intensity of 120μT-200μT was able to increase the proliferation of osteoblasts so that they could heal fractures. The most accurate intensity range in the process of forming osteoblasts is the intensity of 150μT.

CONCLUSION

Based on the analysis that has been done on 30 articles, both national and international articles, it was concluded that exposure to the Extremely Low Frequency magnetic field with an intensity of 120μT to 200μT was found that accurate results in helping the process of splicing fractures were by exposure to an ELF magnetic field of 150μT intensity and duration of exposure. 30' has an effect on the process of forming and secreting organic collagen and non-collagen in Osteoblast cells. However, exposure to Extremely Low Frequency (ELF) Electromagnetic Fields still has a negative impact on health if the intensity of exposure is not in accordance with its use.

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Conflicts of Interest

There are no conflicts of interest declared by the author

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CASE REPORT

Sydenham Chorea On Indonesian 10 Years Old Boy Caused By Rheumatic Heart Disease : Case Report And Literature Review

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ABSTRACT

Sydenham's chorea (SC) is one of the manifestations of rheumatic fever, and is the most common cause of chorea in childrens. SC is characterized by involuntary movements such as jerking of the arms, legs, and face. The following case is a 10-year-old boy with complaints of moving his right arm and leg on its own. On physical examination, there was a grade 4/5 systolic murmur at ICS 5 2 cm lateral to the left MCL blowing radiating to the left arm. In ASTO examination there is an increase. CT scan of the head without contrast showed no abnormalities. The results of echocardiography showed severe mitral regurgitation. The patient was diagnosed with Sydenham cholera and rheumatic heart disease. The patient refused hospitalization and was treated as an outpatient with therapy erythromycin 250 mg four times a day for 10 days followed by a twice daily dose for the next two months, symptomatic haloperidol 1 mg and trihexyphenidyl 0.5 mg twice a day, aspirin 300 mg four times a day for one month. From this treatment, the complaints improved slowly, and the chorea disappeared within 10 days of the start of treatment.

Introduction

Sydenham's chorea (SC) is one of the manifestations of acute rheumatic fever. It is characterized by chorea involving the face and extremities and can include psychiatric symptoms, hypotonia and muscle weakness. Although the incidence is decreasing in high-income countries, SC remains the most common cause of childhood chorea, occurring in approximately one-third of patients with acute rheumatic fever. [1] But there are no exact number or prevalence about the Sydenham Chorea incident in Indonesia. Some evidence shows that in developing countries, the incidence of rheumatic fever is higher, presumably due to poor sanitation compared to developed countries.[2]

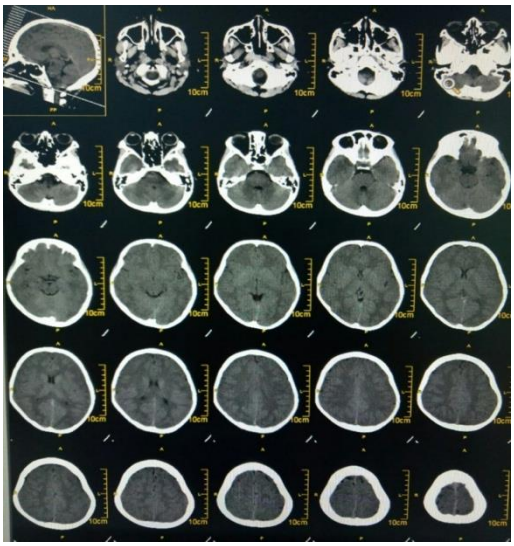
The severity of SC was assessed from mild involuntary movement to severe functional impairment. The involuntary movements that occur during an attack can be repeated from a few minutes to hours, either with breaks between movements or continuously.[3] The patient will experience pain or fatigue due to uncontrolled repetitive movements. Syndenham chorea is a self-limiting disease. However, symptoms can persist for months or years. Syndenham chorea rarely occurs repeatedly.[1]

Various drugs have been used to treat chorea, such as dopamine receptor antagonists (eg, haloperidol), antiepileptic drugs (eg, valproic acid or carbamazepine). [4–8] Studies that examine these drugs in SC patients are very limited and the studies are often observational, objective outcome measures are limited, and the study population is heterogeneous, so the best treatment options are uncertain. We present an Indonesian 10-year-old boy with SC that completely recovered with outpatient management.

Case(s)

A 10-year-old boy came to the neurology clinic with complaints of moving his right arm and leg on its own. Complaints occurred since one week before being taken to the hospital. The patient has difficulty performing activities due to the movement. There were no complaints of fever, cold cough, shortness of breath, painful swallowing, or joint pain. Normal urination and defecation. There is no history of taking certain drugs.

History of the patient's birth at term. The patient was born by spontaneous vaginal delivery. Birth weight 2900grams, birth length 50cm. Patients completed the mandatory immunizations. Growth and development according to milestones. Currently, the patient's education is grade fourth in elementary school. Before getting sick, patient has normal daily activities like any childrens in his age. None of the families experienced complaints as experienced by the patient.



Picture 1. Head CT Scan Without Contras

From the physical examination, the general condition of the patients was adequate and has composmentis consciousness. Blood pressure 110/70mmHg, regular pulse 90x/minutes,

respiratory rate 24x/minutes, temperature 36.8 Celcius. Weigh 22 kg and height 124cm. The general head and neck status showed no abnormalities. Auscultation of the heart show that the patient S1S2 single, grade 4/5 systolic murmur at intercostal (ICS) 5 about 2cm from left midclavicular (MCL) blowing radiating to left arm. Pulmonary examination revealed vesicular sounds, no rhonchi or wheezing. Abdominal examination was normal, there was no hepatomegaly or splenomegaly. Extremity no deformity, edema, or cyanosis.

Neurological examination showed that GCS 456, normal cranial nerves, normal motor strength. Normal physiological reflexes, negative pathological reflexes. Involuntary movement was found in the form of hemichorea. Sensory, autonomic no abnormalities.

On echocardiographic examination, the results showed atrial sinus solitus, AV and VA concordance, normal venous drainage, normal heart chambers, no ASD/PDA/VSD, severe mitral regurgitation with a pressure gradient (PG) of 102 mmHg, no other valve abnormalities were found, normal left ventricular systolic function, normal left aortic arch.

Complete blood count: Hgb 13.6, Leukocytes 3.7, HCT 41.1, Plt 151. Serum electrolytes Na: 135, K: 3.9, Cl: 9.8. An increase in ASTO was found by a value of 442. The results of the head CT scan did not show any abnormalities (Figure 1).

Based on patient history, clinical manifestations, laboratory examination, echocardiography, and imaging, we diagnosed the patient with Sydenham Chorea caused by Rheumatic Carditis. Patients and their families refuse to do hospitization and was treated through outpatients with advice not to do much activity, not to be too tired, and to have regular check-ups at the cardiology and neurology departement.

In the management of this patient, for hemichorea, patient is given haloperidol 1 mg and trihexiphenidil 0.5 mg twice a day. Antibiotic erythromycin 250 mg four times a day for 10 days, then the dose is reduced to two times a day for two months. Aspirin is also given at a dose of 300 mg, taken four times a day for 1 month. The patient's complaints of involuntary movements improved slowly, and disappeared within two weeks of starting treatment.

Discussion

Rheumatic fever (RF) is considered a disease that often affects children (generally between 5-15 years).[9] This disease is rare in children under 5 years of age. Published data estimate that ARF occurs in 1-6.8% of children younger than 5 years. Arthritis and carditis are the most common clinical presentations in this age group. Sydenham's is most common in prepubertal children with a female predominance.[10] The ratio of the incidence of SC in girls to boys is 3:1. In our case it is a 10 year old boy from Indonesia. [2]

Streptococcus are a group of gram-positive bacteria that are morphologically characterized by cocci and chains. Streptococcus pyogenes, which belongs to the GABHS, has the ability to produce toxins that can lyse red blood cells. The cytoplasmic membrane is surrounded by a thick layer of peptidoglycan surrounded by an S layer consisting of carbohydrates, proteins, and glycoproteins. There is also a certain type of carbohydrate, a rhamnose-Nacetyl-glucosamine

dimer with the ability to cross-react with heart valve glycosides.[11]

In syndenham chorea (SC), stimulated antibodies targeted basal ganglia brain cells in the host and its cause a diffuse inflammatory process in the corpus striatum, especially the caudate nucleus. Symptoms of SC are caused by an imbalance between the dopaminergic system, the intrastriatal cholinergic system, and the inhibitory system of gamma-aminobutyric acid (GABA).[12]

SC pathogenesis explains that antibodies produced against GABHS under conditions of acute infection will cross-react with basal ganglia epitopes, disrupting the cortex-basal ganglia-thalamus-cortical (CBGTC) circuit, causing motor, behavioral and cognitive symptoms.[13,14]

Another study found that in SC patients Antibodies also show cross-reactivity to mammalian GM1 lysogangliosides (neural gangliosides) and N-acetyl-β-D-glucosamine (GlcNAc), the carbohydrate dominant epitope of GABHS, and can react with other basal ganglia epitopes. , including the tubulin and dopamine receptors D1 and D2 (D1R, D2R).[15]

Studies linking autoantibodies to SC symptoms showed that serum antiD1R and anti-DR2R autoantibodies were higher in SC patients compared to controls. More importantly, the anti-D2R/anti-D1R ratio correlated with symptom severity in SC patients, as assessed by The Universidade Federal de Minas Gerais (UFMG) SC Rating Scale. [16]

The usage of dopamine antagonists in the treatment of SC indirectly supports the role that dopaminergic-directed autoantibodies play in the pathophysiology of SC.[17] Decreased serum autoantibody titres are associated with improvement in symptoms, while patients with persistent SC exhibit still high titers of anti-basal ganglia autoantibodies. [17]

The use of plasmapheresis and intravenous immunoglobulin is considered to be able to affect circulating antibody levels and is therefore considered effective in the treatment of SC. This is consistent with the theory that the motor and neuropsychiatric symptoms of SC patients are the result of autoantibodies acquired by GABHS targeting neurons, leading to alterations in the cortical-basal ganglia-thalamic circuitry of CBGT.[13,14]There have been case reports that have successfully treated SC patients using intravenous immunoglobulin.[1]

Intranasal GABHS infection in mice is also known to increase a strong specific Th17 response in cranial lymphoid tissue, and that these T cells can migrate to the brain. In the brain, GABHS-specific Th17 cells can induce an IL-17-mediated inflammatory response and/or activate microglia and macrophages leading to BBB damage. This process causes autoantibodies to leak into the olfactory bulb and spread to the basal ganglia and other brain areas.[18]

In addition to antibodies, direct action of cytokines and other immune mediators may contribute to neural dysfunction leading to motor, behavioral, and cognitive symptoms in SC. Studies on B1-cell lymphocytes involved in chronic antibody-mediated autoimmune disease, in SC patients with persistent chorea compared with patients with cured or control chorea. [19]

Genetic factors controlling the immune response to GABHS appear to play a relevant role in susceptibility to ARF and its complications, including SC. The major histocompatibility

complex human leukocyte antigen (HLA) polymorphisms, particularly HLA class II, a class of molecules involved in antigen processing and presentation, have been consistently associated with susceptibility to ARF. [20] Furthermore, each copy of the immunoglobulin heavy chain allele IGHV4-61*02, located in the gene segment IGHV4-61, was found to have an increased risk factor of 1,4 times the risk of rheumatic heart disease. [20]

The Jones criteria are commonly used to diagnose acute RF. The diagnosis of acute rheumatic heart disease (acute or recurrent) can be made if there are two major criteria or one major with two minor. Major criteria are carditis (clinical and/or subclinical), arthritis (polyarthritis only), chorea, erythema marginatum, subcutaneous nodules. Minor criteria are monoarthralgia, fever (≥ 38.5oC), increased ESR (60 mm in the first hour) and/or CRP (3 mg/dL or more than normal), prolonged PR interval (except carditis which is a major criteria), evidence of previous GABHS infection (positive throat culture, positive rapid antigen detection test (RADT), and elevated anti-streptococcal antibody titer). [21]

In SC patients, the characteristic 'dance like movement' is usually described as a randomly occurring sequence of one or more involuntary movements affecting other parts of the body. Movement can also occur in only half of the body called hemichorea, which affects a quarter of people with SC. The severity varies significantly, from mild SC, which has mild or no impact on daily life activities, to severe SC, which makes it difficult for patients to carry out daily life activities. In addition to chorea, patients with CS exhibit other motor symptoms, such as motor impairment, hypometric saccades, hypotonia, and dysarthria. Tic-like movements and vocalizations have been reported, but they usually don't have the typical signal impulses.[12,22]In rare cases, patients may develop hypotonia so severe that the patient is confined to bed, the most severe form of SC known as chorea paralytica. Hyperkinetics and decreased muscle tone are characteristic of acute CS, but patients in CS remission exhibit bradykinesia, suggesting that CS remission patients may develop parkinsonism which may be a marker of CS severity after remission.[12]

Behavioral or psychiatric symptoms are also frequently found in SC patients. Obsessive compulsive disorder (OCD) and attention deficit hyperactivity disorder (ADHD) were more common in SC patients than ARF patients without SC and healthy subjects. In 50 SC patients followed serially with comprehensive psychiatric interviews it was found that the most frequently observed psychiatric disorders included major depression (14%), generalized anxiety disorder (16%), social phobia (24%) and OCD (24%).[23]

As would be expected by immune-mediated CBGTC dysfunction, SC is associated with a range of cognitive deficits that require processing speed and attention. Even patients with SC who had recovered showed impairment in executive function tests, especially verbal fluency, decreased verbal comprehension, which affected their social and occupational functioning. SC patients recover within a few months, and are often considered a benign monophasic condition, with complete remission in more than 80% of patients within six months.[24]

Management goals in SC include: 1) treating and preventing additional GABHS

Infections; 2) control of chorea symptoms; and 3) decisions regarding the need for immune modulation.[12] The most commonly used regimens include a single dose of 1.2 million units of intramuscular (IM) benzathine penicillin G or administration of penicillin VK 500 mg orally for ten days twice daily.[25] The most commonly used for antibiotic prophylaxis regimen is benzathine penicillin G 1.2 million units in children weighing ≥20 kg and using a dose of 600,000 IU in children weighing < 20 kg given IM every three to four weeks.

Patients with mild SC and not affecting activities of daily life (ADL) do not require symptomatic treatment of SC. When SC affects speech, gait, hand skills, affects self-care, academic and social activities, the use of anti-chorea interventions should be considered.[12]

Administration of dopamine antagonists (antipsychotics) and anticonvulsants in the treatment of SC, leads to more rapid symptom resolution and functional improvement. It is based on an autoimmune-induced basal ganglia dysfunction characterized by excessive dopaminergic activation and decreased activation of the basal ganglia inhibitory pathway.[17] While dopamine antagonists may counteract dopaminergic over-activation, the anticonvulsant effect on this pathophysiological process is less clear, and may involve different mechanisms, such as regulating GABA neurotransmission and calcium flow to basal ganglia neurons preventing neuronal hypersynchronization.[12]

Valproic acid and carbamazepine are the most commonly prescribed anticonvulsants for SC. Valproic acid and carbamazepine have the same effectiveness in clinical improvement, remission and recurrence rate of SC patients without significant side effects.[26]

Haloperidol is a dopamine antagonist that is often used to treat SC patients. In the study SC patients treated with haloperidol improved more rapidly and had a lower rate of treatment refractoriness, but had more side effects. The administration of haloperidol should be used with caution because SC patients are at high risk for parkinsonism.[8]

Immunomodulatory drugs that are widely used in SC therapy and are effective include corticosteroids, including oral prednisone, oral deflazacort, and intravenous (IV) methylprednisolone. However, there are some side effects of using high doses of corticosteroids including weight gain and acne and in more severe cases progress to Cushing's disease.[4,6]

SC pathophysiology involves autoantibodies that bind to basal ganglia neurons and affect their function, IVIG can inactivate these autoantibodies, whereas plasmapheresis will extract them from plasma. Thus, all SC patients who received IVIG or plasmapheresis showed clinical improvement.[1,5]

Syndhenham chorea is expected to recover completely in one to six months. A retrospective study of 90 patients showed complete remission of motor symptoms in 85% within six months, and an additional 5% had complete remission within one year.[27]One prospective study of 32 patients with CS, followed for more than 2.5 years, found that symptoms persisted for 2 years or more in 50% of their cases.[28]

Conclusion

Sydenham chorea is a disease caused by group A beta hemolytic streptococcal infection which is characterized by involuntary movements that can be accompanied by behavioral disorders, cognitive impairment, and OCD. Sydenham chorea is a self-limited disease but may show recurrence and/or persistence of motor and neuropsychiatric symptoms in adulthood. Syndenham chorea treatment strategies are antibiotic and prophylactic therapy, symptomatic treatment of syndenham chorea, and immunomodulating interventions. In this case, rheumatic heart disease was also found, which was supported by echocardiography.

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Conflicts of Interest

There are no conflicts of interest declared by the author.

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