



## RELATIONSHIP BETWEEN HEARTBEATS AND BODY COMPOSITION AMONG SOME FATNESS ALGERIANS HOUSEWIVES

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### ABSTRACT

**Background:** In adults, heart rate is the most indirect tests used to estimate VO<sub>2</sub>max and the physiological indicator of intensity of physical work. Studies confirm that the body Physical fitness has a significant modifying effect as cardiovascular disease. Objectives: From the above our focus comes in this modest study on the bases impact of the cardiovascular system, which can modify the activity of every other tissue/organ/system within the body. Where any change within the cardiovascular system will have consequences for the health and functioning of the body. **Material and Methods:** As to explore the risks related to the Body Composition, we based on Ruffier functional test Heart Rate, the hart max (measured directly after 30 squats in 45 secs) and heart Rate rests (measured Advent Effort) for 30 Housewives, their homogeneity was calculated basically on age  $\leq 24$ , BMI class and Questionnaire Physical Activity Rating (PA-R), to determine their physical activities intensity daily effort. **Results:** Based on the analysis statistics we confirmed that the heart rate max is a marker for measuring cardiac risk in the opposite of Heart Rate Rest. Also the inability of our sample return to The higher oxygen demand, which can be realized only by improving cardiac performance and respiratory function at the given work rate. **Conclusions:** Based on our results we recommend our women housewife to control their heart rate in especially their Heart rate max which is a marker for measuring cardiac risk because the most of the similar studies chows that the more sudden deaths are caused by a rapid heartbeat or an irregular heartbeat.

**Keywords:** Body Composition, Heart Rate, Obese Housewife.

### 1. INTRODUCTION

Heart rate is the number of times the heart contracts per unit time, usually expressed in beats per minute [1]. Whereas to determine the accuracy of the temporal change of the heart rate, we use the Electrocardiogram (ECG) or on the heart rate monitor [2], which they require costly equipment [3]. Our come in this modest study is to determine the Association of Body Composition on Heart Rate, based on the heartbeats used to calculate the index Ruffier functional Test. Where the most of similar studies, confirm that the obesity is a most important risk factor nowadays. Which become the main public health problem in the developed country by the start of 21st century [4]. While the defined of Obesity is as an abnormal or excessive accumulation of fat, that may impair health [5]. Whereas the World Health Organization (WHO), shows that any individual with a body mass index (BMI) greater than or equal to 30 kg/m<sup>2</sup> is obese [1]. Whether Alexandra et al, (2012) set that adult who has a BMI between 25 and 29.9 is considered overweight [2]. While the study Norman Edward Robinson and Kim A. Sprayberry (2009), confirm that this syndrome is characterized by a high fat mass (greater than 30%) and risk factor for diabetes and cardiovascular disease [6]. From the fact, we affirmed the consider of Bellamy et al, who approved that 30% of fat women have higher risk to developing type 2 diabetes mellitus in forthcoming life [7]. Where the health professionals have long known, that being overweight carries many serious health risks for adults [8]. As the certification from the nurses' health analyze, who declare that obese women have 2.7 times the risk of infertility compared with women of normal weight [9]. We accept the acknowledgment by Payal (2015) that housewife must maintain their bodies, also learn to balance their habit with exercise as well as dietary relative to the bodily inactivity [10], which advances substantially to complication, death as well as debility [11]. Whereas Hugh et al, (2015) approve that obesity disabilities are accompanied to way of life in particularly cardiovascular disorders [12]. From the proofs, our interest in this modest study comes from lifestyle, which can be significantly influenced by physical inactivity and diet [13-14]. Based on the daily life Algerian homemaker, which backing on the domestic manager [15-16] and the obesity risk account in the Algerian citizenry [17]. Where the similar analyzes accept that the subjects obese may and heat intolerance at given work [18], where the physical exercise is a treatment of health conditions [19-20], in the opposite of the inactive lifestyle [21] according to the American Heart Association, which recommend the Regular aerobic exercise as an important factor to control obesity [22-23].

Through the above Our aims are to use the Heartbeats as a practical control means, which is inexpensive in comparison with the laboratory [23,24,25] techniques [26,27]. Where researchers team choose the Ruffier functional as save test medical to calculate HR<sub>max</sub> (Heart Rate Maximum) and HR<sub>rest</sub> (Rest Heart Rate)[28,29], to Predict: firstly, the Association of Body Composition risks on the efficiency of Heart and secondly, the Heart marker to evaluate the cardiac risk among the obese housewife.

## 2. MATERIAL AND METHODS

### 2.1. THE assessments Tested:

- **Questionnaire Physical Activity Rating (PA-R)** Jackson et al. (1990) [24].

The questionnaire tool is used for categorizing a person's level of physical activity. It used in the equations for the Non-Exercise Fitness Test. Your PAR score is between 0 and 7.

**Application of the test:** Select the number that best describes your overall level of physical activity for the previous 6 MONTHS:

0 points Avoid walking or exercise (for example, always uses elevators, drives whenever possible instead of walking).

1 points Walks for pleasure, routinely uses stairs, occasionally exercises sufficiently to cause heavy breathing or perspiration. Participates regularly in recreation or work requiring modest physical activity (such as golf, horseback riding, calisthenics, gymnastics, table tennis, bowling, weight lifting, or yard work).

2 points 10–60 minutes per week

3 points Over 1 hour per week

Participates regularly in heavy physical exercise (such as running or jogging, swimming, cycling, rowing, skipping rope, running in place) or engages in vigorous aerobic type activity (such as tennis, basketball, or handball).

4 points Runs less than 1 mile per week or spends less than 30 minutes per week in comparable physical activity.

5 points Runs 1–5 miles per week or spends 30–60 minutes per week in comparable physical activity.

6 points Runs 5–10 miles per week or spends 1–3 hours per week in comparable physical activity.

7 points Runs more than 10 miles per week or spends more than 3 hours per week in comparable physical activity [25].

Where all the sample choose the answer 1.

- **The Ruffier functional test**

The efficiency of cardiovascular system is calculated by the Ruffier test, which in simple way and with sufficient rate of reliability sets the functional state of the cardiovascular system and readiness of organism for load. The test is consisting 30 squats in 45 secs as effort; the index value is calculated from formula (1):

$$RI = [(S1 + S2 + S3) - 200]/10 \quad (1)$$

which means:

the HR from the first sitting position, during the maximum relax - S1 the HR after the squats - S2

the HR during the second sitting part, after 1-minute calm down - S3

in our case we have chosen S1 as Heart Rate rest ( $HR_{rest}$ ) and S2( $HR_{max}$ ) as Heart Rate Maximum [26]

- **For the conditions, we are focused on:**

- The social role of its women is based on household chores
- The same marital lifestyle educational social status (no working, no chilled and obligation familial).
- The entire sample does not participate in any programs sportive or physical activity.
- Their BMI are between classified obese class I and overweight.
- Good health based on diagnostic of their doctors.

**2.2 Subjects:** our Sample was Selected by intentional method Represented in 30 women Feminist Association of Municipal Mazagran sidi balabasse their homogeneity was calculated basically on the social and family role and the Questionnaire Physical Activity Rating (PA-R), divided into two groups based on their BMI range less and greater than 29 listed in table 1.

**Table 1:** The table presents the descriptive characteristics and variables of the sample.

Variable	means $\pm$ SD	N=30	Levene's Test	$p \leq 0.05$	n	means $\pm$ SD	T	$p \leq 0.05$
Age (years)	24 $\pm$ 0.71	Body mass index	1.844	0.185	14	28.22 $\pm$ 0.74	-18.3	0.000
Weight (kg)	69.85 $\pm$ 3.01				16	31.53 $\pm$ 0.33		
Height (cm)	1.49 $\pm$ 0.03	Heart Rate Maximum	0.242	0.626	14	76.00 $\pm$ 0.36	-2.58	0.02
					16	77.13 $\pm$ 1.02		
family role no working. no chilled	100% domestic manager without obligation	Heart Rate Rest	0.006	4.387	14	183.2857 $\pm$ 7.75	4.39	0.000
Physical Activity Rating	100% domestic manager				16	174.3750 $\pm$ 2.33		

### 2.3 Data analysis:

Based on the data tests and the data analysis procedures used in this study consisted of the computation of the means, standard deviations, the One-Sample Test, Levene's Test, Multiple linear regression and Correlation Paired Samples. We have chosen the Descriptive statistics where we have calculated the conditions chosen for this experience. With a Significance level was set at  $p \leq 0.05$ . Statistical procedures were done using IBM SPSS 21.0.

## 3. RESULTS

**Table 2:** The table presents the exposed Pearson Correlations of the variables chosen to study

N=30	means $\pm$ SD	Body mass index	Heart Rate Rest	Heart Rate Maximum	Physical Activity Rating
Body mass index	29.98 $\pm$ 1.75	1	-0.519**	-0.595**	0.961**
Heart Rate Rest	76.60 $\pm$ 1.30	-0.519**	1	-0.469**	0.438**
Heart Rate Maximum	178.53 $\pm$ 7.08	-0.595**	-0.469**	1	0.638**
Physical Activity Rating	1.53 $\pm$ 0.51	0.961**	0.438**	-0.638**	1

\*\*, Correlation is significant at  $P \leq 0.01$  level (2-tailed)

From the table 1, all the variables chosen in this study Its sequel normal distribution based on Levene's Test which is greater than P value 0.05. though the BMI range, our sample is consisting of two groups "Overweight" 14 and 16 "obese class I" with a different rate, based on the independent T test, which is in the benefit of the groups obese according to the classification set by Carolyn Coker Ross (2009) and Liane Summerfield (2015) [27-28]. For Rest Heart Rate, the independent T is significant at  $p \leq 0.05$  in the benefit of group class obese. Whereas these differences fall within the standards indicate by Allison Hale and Mary Jo Hovey et al, (2013) which confirm that the normal resting heart rate in adults' ranges from 60 to 100 bpm [29]. Thing confirmed by Peter Kokkinos (2010) at rest in healthy adults [30]. Wherevers all the compare by the independent T in The maximum heart rate are in the benefit of group class obese. Whereas these differences fall within the standards cited by Ernest W. Maglischo et al, (2003) which confirms that, The maximum heart rate decline during the teenage and adult years, usually to a range of 180 to 200 bpm [31]. From the proof, we confirm our hypothesis and background that, BMI and inactive lifestyle affect the heart rate based on the relationship BMI and Rest Heart Rate or Maximum Heart Rate, P-AR and Rest Heart Rate or Maximum Heart Rate and Rest Heart Rate and Maximum Heart Rate, which they are strong negative. see table2

In the opposite of BMI and P-AR, which they are strong positive. From that our results are consisting with Darrin W. Anderson et al, (2008) in case of effort. Where an elevated heart rate and blood pressure during exercise is associated with a higher myocardial oxygen demand [32]. While in the case of BMI class, we agree Melinda S. Sothorn et al, (2006) that the compare in HR peak between obese and non-obese female have Significant differences [33]. Whereas in the case of the risks cardiovascular related to body composing, we agree the find of Jean-Claude Orsini et al, (2005) which confirm that heart rate gradually decreases during the life [34]. Where the average stroke volume at rest is 70 mL ventricular contraction, and heart rate of 60 to 80 according to Lillian Sholtis Brunner et al, (2011). While a very light work can increase the frequency to 80 or 90 beats per minute [35] according to The official works councils and social services (1975). On the basis of those judgments certifying cardiac disability of our sample. We choose to calculate the Multiple linear regression analysis, used to develop a model for predicting the Association of Body Composition on Variability Heart Rate calculate based on Ruffier functional Test [36].

**Table 3:** The table presents the expose multiple linear regression analysis used to develop a model for predicting the Association of Body Composition on Variability Heart Rate Ruffier functional Test

Variables Entered/Removed <sup>a</sup>						
Model	Variables Entered	Variables Removed	Method			
1	Heart Rate Maximum		Stepwise (Criteria: Probability-of-F-to-enter <= 0.050. Probability-of-F-to-remove >= 0.100).			
	Model Summary					
	R	R Square	Adjusted R Square		Std. Error of the Estimate	
	0.595 <sup>a</sup>	0.354	0.331		1.43245	
	ANOVA <sup>a</sup>					
		Sum of Squares	df	Mean Square	F	Sig.
	Regression	31.450	1	31.450	15.327	0.001 <sup>b</sup>
	Residual	57.454	28	2.052		
	Total	88.904	29			
	Coefficients <sup>a</sup>					
		B	Std. Error	Beta	t	Sig.
	(Constant)	56.228	6.709		8.382	0.000
	Heart Rate Maximum	-0.147	0.038	-0.595	-3.915	0.001
	Excluded Variables <sup>a</sup>					
		Beta In	t	Sig.		Partial Correlation
0.307 <sup>b</sup>	1.862	0.073	0.337		0.307 <sup>b</sup>	

a: Dependent Variable: Body mass index; b: Predictors in the Model: (Constant). Heart Rate Maximum

Through the table 3, the Multiple linear regression was employed to help us to determine, which of the Heart Rate Predicts the impact related to Body Composition. Where the program chooses Maximum Heart Rate as predictor variable in the opposite of  $H_{R_{rest}}$ , which is Excluded. Based on these results, we confirm our hypothesis, that Heart rate max is a marker for measuring cardiac risk. Where our results line with the diagnostic, that States body at rest does not mention the problems linked to good health. Where the Joyce Bueker (2002) confirm that Wellness is not a steady state, but an active process [37]. From that we agreed the conclusion of Curtis E. Smith (2014) that the formula for achieving and maintaining good health is not monopolized by prescription drugs [38]. From the documentation, we affirm that the disability of the sample within the effort is destined to higher cardiac output, oxygen consumption and minute ventilation which they are not adequate with the energy requirement of the body and the intensity of work [44,45,46].

## 4. DISCUSSION

Our suggest that heart rate gradually decreases during the life as reported by Jean-Claude Orsini et al (2008), heart rate gradually decreases during the life [38]. The average stroke volume at rest is 70 mL ventricular contraction, and heart rate of 60 to 80 according to Lillian Sholtis Brunner et al (2011). Where a very light work can increase the frequency from 80 to 90 beats per minute [35-39] according to the official works councils and social services (2015) [40]. While these results are not in acceptance with the measures archived in this study, thing approves the cardiac disability of our sample, due to body fat greater than 30 [39]. From that, we accepted in one hand the indication of CIBA Foundation Symposium that, we need to know more about medical standards [40], in other hand we referee to Kazuyuki Kanosue (2015), which appointed that obesity and lifestyle are involved to the diseases of heart rate [41], relative to weights and its correlation with the maximal volume oxygen consumption ( $VO_{2max}$ ) in obese persons [42]. On this analysis, we line with affirmation of Sara Stanner (2008) that moderate intensity activity in obese individual should lead to an increase in breathing rate and increase in heart rate [43]. Which we endorse, that heart rate max is a marker for cardiac risk than heart rate case the obese with inactive lifestyle. Where Undurti (2010) confirm that the problem of obese people has a

direct relationship with fat mass and maximal oxygen consumption [44]. Thing approved by Douglas (2009), in the respiratory function, which is characterized by metabolic function, the ability of heart, the tolerance of the ventilator response and anaerobic threshold during exercise [44,45]. While David et al, (2007) confirm that, the total peripheral resistance body increases at a rate of about 1% per year [46]. James (2013) confirms that the weight gain has significant impact, on the heart show as higher heart rates [47].

In addition, we agreed that positive health return to the decisions, and lifestyles quality chose by individuals. Where the overweight and inactive life have an impact on the cardiovascular system, which can modify the activity of every other tissue/organ/system within the body [48]. Whereas any change within it will have consequences for the health and functioning of the body [49]. Furthermore, our results are consistent with Neil Armstrong (2008), that the effectiveness of body mass ratio is related with the work output in oxygen consumption [50], heart rate, and cardiac output during exercise which they are linear with heart max [51]. For the causes we refer to the similar Studies which show that the obese person has a reduced of the VO2max [33] due to rapid heartbeat (ventricular tachycardia) or an irregular heartbeat [52]. Through the approves, we confirm in one hand that the inability of our Housewife is due to the level of their physical daily activity [53]. Where the active lifestyle helps them to eliminate the cardiovascular risk [54]. In other word, we confirm that the heartbeat should not exceed to 140 beats per minute [55], the case of the effort proposes in this experience, which is in level of the ventilatory anaerobic threshold according to Philippe et al, (2006) [56].

Based on the facts, we affirmed the advice of Vincent et al, (2013) that our women should have a physical fitness program [57].

From the above we confirm:

- The lifestyle inactivity increase overweight [58], which required a higher cardiac output and minute ventilation at a given work rate [59].
- Hearth max provides a better reflection about the Heart efficiency as quality of Wellness life [60].
- The level cardiorespiratory fitness reflects the integrative ability of the components of the cardiopulmonary system to deliver oxygen to the metabolically active skeletal muscles [5] which provides a better reflection about the status healthy lifestyle housewife [61].
- Heart rate max is a marker for measuring cardiac risk in the opposite of Heart Rate Rest [56].

## 5. CONCLUSION

Based on our results, we confirmed that the heart rate max is a marker for measuring cardiac risk in the opposite of Heart Rate Rest. Whereas the inability of our sample return to the higher oxygen demand, which can be realized only by improving cardiac performance, and respiratory function at the given work rate. On this evidence, we recommend our women housewife to adapt a physically active lifestyle, that will allow them to control their ideal weight, and their heartbeats in especially their Heart rate max. Which is a marker for measuring cardiac risk. Because the most of the similar studies show, that the more sudden deaths are caused by a rapid heartbeat or an irregular heartbeat.

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