Effect of Obesity and Socioeconomic Status on Adolescents' High School Students' Intelligence Quotient in Baghdad City

تأثير السمنة والحالة الإجتماعية الإقتصادية على حاصل الذكاء لليافعين من طلبة المدارس الثانوية في مدينة بغداد

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المستخلص

الهدف: لتحديد تأثير السمنة و الحالة الإقتصادية – الإجتماعية على حاصل الذكاء للمراهقين لدى طلبة المدارس الثانوية في مدينة بغداد.

المنهجية: تم إجراء تصميم وصفي لتحديد تأثير السمنة و الحالة الإقتصادية – الإجتماعية على حاصل الذكاء للمراهقين من طلبة المدارس الثانوية في مدينة بغداد للفترة من ٧ يناير ٢٠١٧ وحتى ٢٩ مايو ٢٠١٧. إختيرت عينة غير إحتمالية، غرضية، من (١٢٠) من طلبة المدارس الثانوية. وتكونت عينة الدراسة من (١٢) طالبا وطالبة من الصف السابع و (٢٦) طالبا وطالبة من الصف الثامن و (١٤) طالب وطالبة من الصف التاسع و (٣٥) طالبا وطالبة من الصف العاشر و (١٣) طالبا من الصف الحادي عشر (٢٠) طالبا من الصف الثاني عشر. وتتكون من (٤٧) ذكور و (٧٣) إناث. (١٩-١١) سنة. وقد تم بناء إستبيان من أجل تحقيق أهداف الدراسة ومن خلال مراجعة الأدبيات ذات الصلة والتشاور من فريق من الخبراء. يتكون الإستبيان من (٥٠) فقرة تقيس حاصل الذكاء لدى طلبة المدارس الثانوية. حيث تم قياس حاصل الذكاء على أنه فقير (٥٠-١١٦,٦) ومتوسط (١١٦,٧-١٨٣,٣) وجيد (١٨٣,٤-٢٥٠). طور مقياس الحالة الإجتماعية-الإقتصادية لقياس الوضع الإجتماعي والإقتصادى للطلبة على أساس كونه عالي(٢٦-٢٩)، معتدل (١٦-٢٥)، ومنخفض (٥-١٠). تم قياس مؤشر كتلة الجسم لتحديد السمنة للطلبة كسمنة من الدرجة الأولى والدرجة الثانية والدرجة الثالثة. حدد صدق المحتوى للإستبانة من خلال عرضها على مجموعة من الخبراء وثبات الإتساق الداخلى للإستبيان بإستخدام تقنية تقسيم النصف وإحتساب معامل إرتباط ألفا لمثل هذا الثبات. وتشير النتائج إلى أن معامل الإرتباط هو (0.87 =r)الذى يعتبر كافيا لثبات الإستبانة كمقياس للظاهرة الكامنة من وراء الدراسة. تم جمع البيانات من خلال إستخدام أداة الدراسة وتقنية المقابلة كوسيلة لجمع البيانات للفترة من ٢١ فبراير ٢٠١٧ إلى ٢٠ مارس ٢٠١٧. تم تحليل البيانات من خلال تطبيق المنهج الوصفي لتحليل البيانات الذي يتضمن التكرارات والنسبة المئوية والدرجة الكلية.

النتائج: بينت نتائج الدراسة بأن السمنة والحالة الإجتماعية-الإقتصادية تؤثران على حاصل الذكاء لدى الطلبة. أكدت الدراسة بأن السمنة يمكن أن تؤثر تأثيرا كبيرا على حاصل الذكاء للطلبة والطلبة ذوي الوضع الإجتماعي والإقتصادي المنخفض والمعتدل شهدوا درجات منخفضة من حاصل الذكاء.

التوصيات: وتوصي الدراسة إلى إمكانية تصميم وتنفيذ برنامج تعليمي لأولياء أمور الطلبة الذين يعانون من السمنة المفرطة من أجل زيادة وعيهم حول تأثير السمنة على حاصل الذكاء. يمكن تقديم دورات خاصة للطلبة الذين يعانون من السمنة المفرطة وأولئك المعرضين لخطر السمنة التي يتم من خلالها تجنب زيادة الوزن و / أو معالجته. يمكن إجراء مزيد من البحوث على عينة كبيرة مع خصائص مختلفة.

Abstract

Objective(s): To determine the effect of obesity and socioeconomic status upon adolescents' high school students' intelligence quotient in Baghdad City.

Methodology: A descriptive design is carried throughout the study to determine the effect of obesity and socioeconomic status on adolescents' high schools students' intelligence quotient in Baghdad City for the period of January 7th 2017 to May 29th 2017. A non-probability, purposive sample, of (120) high school students, is selected. The sample is comprised of (12) students from 7th grade, (26) students from 8th grade, (14) students from 9th grade, (35) students from 10th grade, (13) students from 11th grade, and (20) students from 12th grade. It is consisted of (47) males and (73) females; and age of (11-19) years old. A questionnaire has been constructed throughout the following procedures in order to achieve the aims of the study through review of relevant literatures and consultation from a panel of experts. The questionnaire is comprised of (50) item that measure the high school students' intelligence quotient. The intelligence quotient is measured as poor (50-116.6), fair (116.7- 183.3), and good (183.4-250). A socioeconomic status scale is developed to measure the students' socioeconomic status as high (26-29), moderate (16- 25), and low (5-10). A body max index (BMI) is measured to determine the students' obesity as grade I, grade II and grade III. Content validity of the questionnaire is determined through panel of experts and the internal consistency reliability is determined for the study questionnaire with a split-half technique Cronbach alpha correlation coefficient is computed for such reliability. Findings indicate that the correlation coefficient is (r=0.87) which is considered adequate for the reliability of the questionnaire as measure for the phenomenon underlying the study. Data are collected through the use of the study instrument and the interview technique as means for data collection for the period of February 21st 2017 to March 20th 2017. Data are analyzed through the application of the descriptive data analysis approach which includes frequency, percent and total score.

Results: Middle age and Female students experience low level of intelligence quotient more than others. Results of the study reveal that students' obesity and socioeconomic status affect their scores of intelligence quotient. The study reveals that obesity can dramatically influence students' intelligence quotient. Students with low and moderate socioeconomic status have experienced low scores of intelligence quotient.

Recommendations: The study recommends that education program can be designed and implemented to parents of obese students in order to increase their awareness about the effect of obesity on students' intelligence quotient. Special courses can be presented to obese students and those at the risk of obesity by which weight gain is avoided and/or treated. Further research can be conducted on large sample size with different characteristics.

Introduction:

O besity is an abnormal accumulation of body fat, usually 20% or more over an individual's ideal body weight. Obesity is associated with increased risk of illness, disability, and death. The World Health Organization terms obesity a worldwide epidemic, and the diseases which can occur due to obesity are becoming increasingly prevalent [1].

Body mass index (BMI) is a measure used to determine childhood overweight and obesity. Obesity is defined as a BMI at or above the 95th percentile for children and teens of the same age and sex [2].

Intelligence Quotient (IQ) is a number meant to measure people cognitive abilities (intelligence) in relation to their age group. An I.Q between 90 and 110 is considered average; over 120, superior [3].

Low socioeconomic status (SES) children perform on average worse on intelligence tests than children from higher SES backgrounds, but the developmental relationship between intelligence and SES has not been adequately investigated. Specifically, children from low SES families scored on average 6 IQ points lower at age 2 than children from high SES backgrounds; by age 16, this difference had almost tripled. Although these key results did not vary across girls and boys [4].

We do believe that obesity and socioeconomic status can influence the high school adolescence's intelligence quotient. Unfortunately, the relationship between obesity and socioeconomic status and intelligence quotient has not been investigated in the literature. However, the present study is considered a genuine one.

Throughout the present study, the impact of obesity and socioeconomic status on high school adolescence's intelligence quotient is determined. So, the study will provide necessary information by which school teacher can deal with these critical issues in terms of their management.

Methodology:

A descriptive design is carried throughout the study to determine the effect of obesity and socioeconomic status on adolescents' high schools students' intelligence quotient in Baghdad City for the period of January 7th 2017 to May 29th 2017.

The study is conducted in Al - Karkh Preparatory School for Girls and Al - Karkh Secondary School for Boys at Al- Karkh Sector in Baghdad City Al-Seef Al-Arabi Preparatory School and Al-Hadhara Secondary School at Al- Rusafa Sector in Baghdad City.

A non-probability, purposive sample, of (120) high school students, is selected. The sample is comprised of (12) students from 7th grade, (26) students from 8th grade, (14) students from 9th grade, (35) students from 10th grade, (13) students from 11th grade, and (20) students from 12th grade. It is consisted of (47) males and (73) females; and age of (11-19) years old.

A questionnaire has been constructed throughout the following procedures in order to achieve the aims of the study: 1. Review of relevant literature, and 2. Consultation from a panel of experts. The questionnaire is comprised of (50) item that measure the high school students' intelligence quotient. The intelligence quotient is measured as poor (50-116.6), fair (116.7-183.3), and good (183.4-250). A socioeconomic status scale is developed to measure the students' socioeconomic status as high (26-29), moderate (16-25), and low (5-10). A body max index (BMI) is measured to determine the students' obesity as grade I, grade II and grade III.

A pilot study is carried out from January 7th 2017 to February 20th 2017 to determine the content validity and internal consistency reliability of the study instrument. Internal consistency reliability is determined for the study questionnaire with a split-half technique. A purposive sample of (20) student is selected for the purpose of the reliability of the questionnaire. Cronbach alpha correlation coefficient is computed for such reliability. Findings indicate that the correlation coefficient is (r=0.87) which is considered adequate for the reliability of the questionnaire as measure for the phenomenon underlying the study. Content validity of the instrument is determined though panel of (9) experts. The experts are asked to review the instrument. Their responses indicate that all of the experts agree of that all (50) items of the instrument are adequately valid parameters for the measurement of the phenomenon underlying the study.

Data are collected through the use of the study instrument and the interview technique as means for data collection for the period of February 21st 2017 to March 20th 2017. Data are analyzed through the application of the descriptive data analysis approach which includes frequency, percent and total score.

Results:

Table (1): Overall Evaluation of Students' Intelligence Quotient

Intelligence Quotient	Number of Students
Poor (50-116.6)	80(67%)
Fair (116.7-183.3)	30(25%)
Good (183.4-250)	10(8%)

%= Percent

Results out of this table reveal that most of the students have experienced poor level of intelligence quotient (67%).

**Table (2): Distribution of Students by Their Intelligence
        Quotient, Obesity and Age**

Intelligence Quotient	Number of Students	Obesity/Age (Years)		
		Early (11-14)	Middle (15-17)	Late ≥ 18
Poor	80(67%)	18(66.6%)	44(67.6%)	18(64.2%)
Fair	30(25%)	7(25.9%)	15(23%)	8(28.5%)
Good	10(8%)	2(7.4%)	6(9.2%)	2(7.14%)

%= Percent, ≥= Greater than or equal to

Results out of this table depict that most of the obese students have experienced poor level of intelligence quotient (66.6%), particularly those with middle age (15-17) years old (67.6%).

**Table (3): Distribution of Students by Their Intelligence
        Quotient, Obesity and Gender**

Intelligence Quotient	Number of students	Obesity/Gender	
		Male	Female
Poor	80(67%)	27 (57.44%)	53 (72.6%)
Fair	30(25%)	15 (31.92%)	15 (20.54%)
Good	10(8%)	5 (10.63%)	5 (6.85%)

%= Percent

Results out of this table reveal that obese females are accounted for most of the subjects who have experienced poor level of intelligence quotient (72.6%).

**Table (4): Distribution of Students by Their Intelligence Quotient,
Socioeconomic Status (SES) and Obesity**

Intelligence Quotient	Number of Students	SES/Obesity		
		Low (5-10)	Moderate (11-25)	High (26-29)
Poor	80(67%)	24(50%)	56(77.7%)	0
Fair	30(25%)	19(39.5%)	11(15.2%)	0
Good	10(8%)	5(10.5%)	5(6.9%)	0

%= Percent

Results out of this table indicate that students of low (50%) and moderate (77.7%) socioeconomic status have experienced poor level of intelligence quotient, while students of moderate socioeconomic status experience greater level of poor intelligence quotient than others.

Discussion:

Part I: Discussion of the Overall Evaluation of the Students Intelligence Quotient

Analysis of such overall evaluation presents empirical evidence that those obese students have experienced poor level of intelligence quotient (Table 4-1). This finding can be interpreted in a way that obesity can be considered as risk factor for students who cannot obtain satisfactory scores of intelligence quotient.

Findings, from cross-sectional studies, indicate that children who are overweight scored lower on math and reading tests when compared to non-overweight counterparts [5]. Another study has found that adolescents who are obese earn lower test scores than students who are of average weight [3].

Part II: Discussion of the Relationships between Students' Obesity and Their Socio-demographic Characteristics

Such relationships depict that obese middle age students experience more poor level of intelligence quotient than others (Table 2). This finding provides empirical evidence that students, at this age, become at greater risk of having low intelligence quotient scores. This can be considered as critical issue.

With regard to the students' gender, the study indicates that obese female students have earned low intelligence quotient scores than obese male students (Table 3). This finding presents other empirical evidence that obese female students' intellectual ability and cognitive ability is different than that of obese male students.

Concerning the obese students' socioeconomic status, the findings reveal that obese students with low and moderate socioeconomic status have gained low intelligence quotient scores, but those, with moderate socioeconomic status, have made poor level of intelligence quotient more than those with low socioeconomic status (Table 4). In a descriptive correlational study, Obesity and overweight among children in Europe is also associated with the socio-economic status of their parents, especially their mothers [6].

In sum, the study confirms that obesity can dramatically influence students' intelligence quotient; middle age and Female students experience low level of intelligence quotient more than others; and students with low and moderate socioeconomic status have experienced low scores of intelligence quotient.

Recommendations:

The study recommends that:

1. Education program can be designed and implemented to parents of obese students in order to increase their awareness about the effect of obesity on students' intelligence quotient.

2. Special courses can be presented to obese students and those at the risk of obesity by which weight gain is avoided and/or treated.

3. Further research can be conducted on large sample size with different characteristics.

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