Research Paper

The Relationship Between Psychophysical Indicators and Hostile Behavior Among School-aged Children

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ABSTRACT

Objectives: The health of school-aged children is measured using normal physical and psychological indicators. The most common behavioral problem among children is hostility, which increases and has a negative impact. This study aims to assess psychophysical indicators and hostile behavior among school-aged children and to detect the relationship between this behavior and psychophysical indicators.

Methods: A cross-sectional study was conducted in Al-Najaf governmental schools. The cluster sample included 384 (girls and boys) school-aged children. Data were collected using an adopted Arabic version of the questionnaire to test psychophysical indicators and hostile behaviors. Experts in this field confirmed the tool's content validity, and its reliability was obtained using Cronbach's α (0.88 and 0.92).

Results: This study showed that most children are boys (62.2%), aged 8-10 years (46.1%), and in the first and second stages (42.5%). About (51.8%) had hostile behavior extending from mild (35.9%) to severe (8.1%). While psychophysical indicators (58.1%) were abnormally assessed, all physical indicators (70%) were normally assessed in children. Finally, the relationship between hostility and psychophysical indicators are significant at (P=0.012) and a strong positive correlation is observed between them (0.94).

Discussion: This study concluded that more than half of children have hostile behavior and problems with psychophysical indicators, but some indicators are normal, such as body mass index (BMI) percentile, heart rate, breathing, cognitive, and movement indicators. Also, this study concluded that the psychophysical indicators are abnormal among children, which increased the severity and symptoms of hostile behavior among them. This study recommends increasing parents' awareness of mental health by teaching them how to nurture their children and integrate programs in the education system, especially in the primary school curriculum, and how to control their children's anger and accept a situation that triggers and prevents hostile behavior.

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Highlights

- Assessment of the relationship between psychophysical indicators and hostile behavior in school-aged children.
- Children aged 8-10 years from governmental schools in Al-Najaf were included in the study.
- The children exhibited hostile behavior ranging from mild to severe.
- More than half of the children had abnormal psychophysical indicators; however, approximately three-quarters had normal physical indicators.
- Recommendations include increasing parental awareness of mental health and integrating anger management programs into primary school curricula to help children manage hostile behaviors.

Plain Language Summary

More than one-quarter of children worldwide show symptoms of abnormal behavior and have issues with psychophysical indicators. Various physical, psychological and social indicators assess children's health, which must meet standard levels for each age stage. Hostile behavior is a common issue among school-age children and can have negative impacts on them, their families and the community. In Iraq, limited information on child health and hostile behavior prompted this study to assess the relationship between psychophysical indicators and hostile behavior in school-aged children. This study found that maintaining a healthy state among children reduced hostility and decreased its impact on parents, schools and the community. Raising parental awareness is crucial to improve the mental health of children, teaching parents how to nurture their children and integrating programs into primary school curricula to help children control anger and manage situations that trigger hostile behavior.

Introduction

Psychophysical indicators are the most crucial criteria for detecting the health state of children, especially at the school-age stage [1]. Therefore, this stage is vital in a child's life because it exposes him to various factors and affects his growth and development [2]. It is also essential in shaping a child's personality traits and academic journey [3]. Psychophysical indicators encompass various aspects related to the health state of children, including the main psychological aspects, such as cognitive and learning features, language and understanding [4], attention, emotions [5], and social relationships [6]. The language domain is vital for evaluation because it is an essential indicator of the level of knowledge and cognitive skills [7]. The cognitive domain is crucial for children's academic success, social interaction, and overall wellbeing [8]. Together, these domains reflect children's psychological health and are associated with their thriving and success in school and life [9]. These indicators help determine whether a child is developing problematic or non-problematic and predict the children's future psychological health [10]. The physical aspects included body mass index (BMI) percentile, heart rate, breathing, and movement indicators. The BMI percentile is crucial for children's health [11]. Some studies showed that children who have abnormal weight may be more prone to hostile behavior, low self-esteem, and difficulties in relationships with others [12] [13]. Developing fine motor skills in childhood is crucial for overall development, impacting a child's academic and practical abilities and social connections throughout life [14].

Hostile behavior can lead to health, psychological, and social impacts on the child, family, and peers, and hostile children are at risk of experiencing emotional distress, such as phobias, depression and panic attacks [15]. Thus distresses can harm themselves or others, and children need more health services and support than normal children in schools, homes, and communities [16, 17].

This study aims to assess hostile behavior and psychophysical indicators among school-age children and determine the relationship between psychophysical indicators and hostile behavior.

Materials and Methods

Study design

A cross-sectional study design was used to fit the study objectives. This design achieved its objectives by providing valuable insights into population traits and detecting correlations for further research.

Setting of study

This study was conducted in Al-Najaf Province, Iraq, and included primary governmental schools. Al-Najaf governorate is located in the middle of Iraq and is one of the crucial holy provinces in Iraq and the Islamic world. Al-Najaf governorate had six main sectors, and the researchers of one sector were randomly selected to conduct the study. This study was conducted from December 1, 2023, to the end of February 2024.

Al-Najaf primary schools had more than (571) governmental and private schools (17), but the study sample included only (21) girls' and boys' primary schools. These schools include only governmental schools located in the southern sector. By 2023, these primary schools accommodated more than 200 thousand children, but the number of new schools has increased. All children who participated in the study informed their parents about the study's aims and the importance of their participation before meeting the child. Data were collected using a modified Arabic version of the hostile behavior and psychophysical indicators scale for school-aged children.

Sample size

The study sample was a cluster sample, including 384 children who studied in the southern sector of Al-Najaf primary schools and whose parents agreed to participate. The sample was selected using a simple sampling method (luck lottery) and all children in all governmental primary schools were allowed to participate in the study. This study included this category because this class is a transition stage in a child's life between childhood and adolescence, which is crucial in developing physical and mental health, personal traits, behaviors and dealing with peers and educated teachers.

The sample size of the study was calculated 6 294 children according to the size of the population target (school-aged children) in governmental schools in the southern sector of Al-Najaf Province, therefore the sample size was equal to 384 children according to the calculated size tables [18]. The study depended on the objectives and criteria of the study sample to reduce the bias that could occur and give all school-age children an equal chance to exhibit in the study.

Study instruments

The study variables included the vital aspects of psychophysical indicators in this stage, including the severity of hostile behavior among children and demographic characteristics related to and affecting these variables, such as age, order among siblings, sex and stage study.

The study used the adopted tool to measure the study variables and included three main parts: demographic characteristics of children, such as age, order among siblings, sex, and stage study and the hostile behavior scale of the Arabic version of the manual of psychological and educational standards and tests, designed each scale of the Arabic environment. The hostile behavior scale was designed to detect the severity of hostile behavior in children or those suspected of having symptoms. The scale had three rated responses: Always to never (3-1). The explanation by cutting the points of the symptoms and severity of hostility can be assessed from normal to severe.

The second part related to the psychophysical indicators scale included the first two sub-parts related to the psychological indicators scale (33) with items, including five crucial aspects, such as cognitive problems (8 items), attention problems (6 items), language problems (10 items), social problems (5 items), emotional problems (4 items) and the second sub-part related to physical indicators, including BMI percentile (weight, height with birth date), heart rate, breath rate and movement aspect (10 items), which explained their score using the score and cut of points for each indicator with the final scale.

Validity and reliability of the instrument

The instrument's validity was examined using content validity and about 13 experts in the psychology and psychiatric fields and modified with study variables. The reliability of hostile behavior (0.92) and psychophysical indicators (0.88) was obtained using Cronbach's α compared to studies of Buss and Bint Ibrahim Al-Omar (0.78) [19, 20].

Data analysis

The study results were analyzed using SPSS software, version 24 and Microsoft Excel to input the data. The data were tested using descriptive and inferential statis-

Table 1. Distribution of school-age children according to their demographic characteristics (n=384)

Variables		No. (%)
Age groups (y)	<8	77(20.1)
	8-10	177(46.1)
	>10	130(33.9)
Gender	Male	239(62.2)
	Female	145(37.8)
Level of education (stage)	1st	86(22.4)
	2nd	77(20.1)
	3rd	58(15.1)
	4th	45(11.7)
	5th	55(14.3)
	6th	63(16.4)
Number of families (members)	<4	71(18.5)
	4-5	187(48.7)
	6-7	101(26.3)
	>7	25(6.5)
Order among siblings	1st	131(34.1)
	2-3	172(44.8)
	4-5	70(18.2)
	>5	11(2.9)
Residence	With parents	322(83.9)
	With father	14(3.6)
	With mother	46(12.0)
	With relatives	2(0.5)
Total		384(100)

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tics tools to achieve the study aims, such as frequency, mean, analysis of variance (ANOVA), Cronbach's α, standard deviation, and the mean of scores to variables of study and cut of points according to rated responses for each one (cut-off points, mean of scores [M.S], normal [mean of scores 1-1.5], abnormal or symptomatic [mean of scores equal or more than 1.51]; however, the assessment of scores included all domains except BMI percentile, normal assessment extended between [1.67-2.33] and the value of M.S. if less or more this range was considered as abnormal assessment).

Results

The study included all children in governmental primary schools in the southern sector of Al-Najaf Province selected using the luck lottery approach and Table 1 presents their demographic characteristics. Most children were male (62.2%) and aged between (8-10) years

Table 2. Distribution of school-age children according to hostile behavior and psychophysical indicators (n=384)

Domains of Scales			No. (%)	Mean±SD	Assessment
Hostile behavior		Normal	185(48.2)	1.76±0.91	Symptomatic
		Mild	138(35.9)		
		Moderate	30(7.8)		
		Severe	31(8.1)		
Psychophysical indicators	Heart rate	Low heart beat	119(31)	1.31±0.46	Normal
		Normal heart beat	265(69)		
	Breath rate	Low breath rate	148(38.5)	1.39±0.49	Normal
		Normal breath rate	236(61.5)		
	BMI percentile	Under-weight	12(3.1)	2.26±0.63	Normal
		Normal	290(75.5)		
		Over-weight	54(14.1)		
		Obese	28(7.3)		
	Movements domain	Abnormal movements	96(25)	1.25±0.43	Normal
		Normal movements	288(75)		
	Language domain	Abnormal	362(94.3)	1.94±0.23	Abnormal
		Normal	22(5.7)		
	Cognitive domain	Abnormal	165(43)	1.43±0.5	Normal
		Normal	219(57)		
	Attention domain	Abnormal	349(90.9)	1.91±0.29	Abnormal
		Normal	35(9.1)		
	Social domain	Abnormal	207(53.9)	1.54±0.5	Abnormal
		Normal	177(46.1)		
	Emotional domain	Abnormal	228(59.4)	1.6±0.49	Abnormal
		Normal	156(40.6)		
	Overall psychophysical indicators	Abnormal	223(58.1)	1.58±0.49	Abnormal
		Normal	161(41.9)		

Table 3. Differences between means of hostile behavior and demographic characteristics of school-aged children (n=384)

Variables		Overall Hostility Behavior Mean±SD	F	P	Sig.
Age groups	<8	2.01±1.12	4.17	0.02	HS
	8-10	1.73±0.91			
	>10	1.65±0.74			
Gender	Male	1.72±0.88	0.88	0.35	NS
	Female	1.81±0.96			
Level of education	1st stage	1.95±1.05	1.46	0.20	NS
	2nd stage	1.68±0.88			
	3rd stage	1.72±0.97			
	4th stage	1.87±0.94			
	5th stage	1.62±0.76			
	6th stage	1.67±0.74			
Number of families	<4 members	1.76±0.89	1.06	0.37	NS
	4-5 members	1.81±0.95			
	6-7 members	1.69±0.89			
	>7 members	1.36±0.5			
Order among siblings	1st	1.82±0.96	0.54	0.66	NS
	2-3	1.79±0.91			
	4-5	1.67±0.85			
	>5	1.68±0.99			

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(46.1%), with stage education in the first stage (22.4%), while less stage education of children is the fourth stage (11.7%), about half of the sample is the number of family members between (4-5) people with parents (48.7%) and only (6.5%) is a family number more than (7) people, while order among siblings is (2-3) approximately (44.8%).

This study included two variables: hostile behavior and psychophysical indicators. Table 2 shows that about (48.2%) of the sample exhibited normal behavior. In comparison, the residual percentage of children with symptoms of hostile behavior and severity extending from mild severity (35.9%) to severe is lower (8.1%); however, according to the mean score, the assessment is symptomatic behavior. While physical indicators are normal in assessment among children, psychological indicators are normal in cognitive aspects only and abnormal in all other psychological indicators, such as language, attention, emotion, social, and overall. Table 3 shows that the differences between the mean hostile behavior and demographic characteristics of children are highly significant with age group only, while it had no significant meaning with gender, level of education, residence, and number of families. On the other hand, Table 4 showed that psychophysical indicators had a highly significant meaning with age group and level of education at P=0.05; however, they had no significant meaning with gender, residence and number of families at P=0.05.

Table 4. Differences between means of psychophysical indicators and demographic characteristics of school-aged children and their demographic characteristics (n=384)

Variables		Mean±SD	F	P	Sig.
		Overall Psychophysical Indicators			
Age groups (y)	<8	1.94±0.25	35.50	0.000	HS
	8-10	1.57±0.5			
	>10	1.38±0.49			
	Total	1.58±0.49			
Gender	Male	1.60±0.49	1.23	0.27	NS
	Female	1.54±0.5			
	Total	1.58±0.49			
Level of education (stage)	1st	1.94±0.24	21.06	0.000	HS
	2nd	1.69±0.47			
	3rd	1.5±0.5			
	4th	1.29±0.46			
	5th	1.36±0.49			
	6th	1.43±0.5			
	Total	1.58±0.49			
Number of families (members)	<4	1.72±0.45	2.40	0.07	NS
	4-5	1.55±0.5			
	6-7	1.53±0.5			
	>7	1.6±0.5			
	Total	1.58±0.49			
Order among siblings	1st	1.59±0.49	0.16	0.93	NS
	2-3	1.56±0.5			
	4-5	1.6±0.49			
	>5	1.64±0.5			
	Total	1.58±0.49			

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Table 5 showed no significant relationship between children's hostile behavior and their psychophysical indicators and between hostile behavior and BMI, heart rate, breath rate, language and cognitive at (0.05), but a highly significant relationship between hostility with their movement, attention, social, and emotional behavior and a significant relationship with overall psychophysical indicators at (P=0.003).

Finally, Table 6 shows a weak correlation between hostility and psychophysical indicators in most domains, except for cognitive, movement, social and emotional

Table 5. Differences between means of hostile behavior and psychophysical indicators of school-age children (n=384)

Variables		Mean±SD	F	P	Sig.
		Overall Hostility Behavior			
BMI percentile	Underweight	2±0.95	2.28	0.079	Ns
	Normal	1.69±0.87			
	Overweight	1.89±1			
	Obese	2.07±1.05			
Heart rate	Abnormal	1.71±0.92	2.83	0.093	Ns
	Normal	1.87±0.89			
Breath rate	Abnormal	1.81±0.95	2.31	0.129	Ns
	Normal	1.67±0.84			
Movement domain	Normal	1.65±0.83	15.98	0.000	Hs
	Abnormal	2.07±1.06			
Language domain	Normal	1.77±0.92	0.01	0.94	Ns
	Abnormal	1.76±0.91			
Cognitive domain	Normal	1.72±0.86	1.03	0.31	Ns
	Abnormal	1.81±0.97			
Attention domain	Normal	1.2±0.47	15.03	0.000	Hs
	Abnormal	1.81±0.92			
Social domain	Normal	1.58±0.70	13.52	0.000	Hs
	Abnormal	1.91±1.03			
Emotional domain	Normal	1.58±0.74	9.91	0.002	Hs
	Abnormal	1.88±0.99			
Overall psychophysical indicators	Normal	1.62±0.77	6.36	0.012	S
	Abnormal	1.86±0.99			

BMI: Body mass index.

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domains, and a high correlation with the overall psychophysical indicator domains of school-aged children.

Discussion

Hostility behaviors and psychophysical indicators affect children and their parents during the early school-age period because they are crucial in forming the personality, impressions, and development of their physical and psychological health [21]. However, only a few studies have examined these variables in Iraq.

Therefore, this study focused on school-aged children to establish an essential background for future studies. Growth in children is a crucial process related to many indicators that every child should achieve normal and healthy mental and physical growth. This study revealed the psychophysical indicators normally in all measured physical indicators, such as BMI percentile, heart rate, breathing, and their motors and movements, and psychological aspects were normally in cognitive indicators only. However other psychological indicators were found to be abnormal in assessment, such as attention, language and understanding, emotions, social relation-

Table 6. The correlation between hostile behavior and psychophysical indicators of school-age children (n=384)

Variables		No. (%) Hostility Behaviors	Correlation Spearman's	Types of Correlation
BMI percentile	Underweight	12(3.1)	0.18	Weak positive correlation
	Normal	290(75.5)		
	Overweight	54(14.1)		
	Obese	28(7.3)		
Heart rate	Abnormal	119(30.9)	-0.26	Weak negative correlation
	Normal	265(69.1)		
Breath rate	Abnormal	148(38.5)	-0.101	Weak negative correlation
	Normal	236(61.5)		
Movements domain	Abnormal	96(25)	0.52	Positive correlation
	Normal	288(75)		
Language domain	Abnormal	362(94.3)	0.22	Weak positive correlation
	Normal	22(5.7)		
Cognitive domain	Abnormal	165(42.9)	0.6	Positive correlation
	Normal	219(57.1)		
Attention domain	Abnormal	349(90.8)	0.15	Very weak positive correlation
	Normal	35(9.2)		
Social domain	Abnormal	207(53.9)	0.57	Positive correlation
	Normal	177(46.1)		
Emotional domain	Abnormal	228(59.4)	0.59	Positive correlation
	Normal	156(40.6)		
Overall psychophysical indicators	Abnormal	223(58.1)	0.94	Very strong positive correlation
	Normal	161(41.9)		
Total				384

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ships, and assessment of overall psychophysical indicators. Perhaps because the culture of Iraqi society focuses on the physical aspects of the child and neglects the psychological aspects due to their lack of awareness, in addition to the fact that most parents have a low level of education, which negatively reflects the child's psychological health, which is consistent with the results of Alhamoodi [22].

However, hostile behavior is a common problem among children, especially among Iraqi children, because the nurturing of parents depends on the punishments and nerviness, especially toward boys than girls, and it often extends to violence; this result of the study revealed that more than half of the children had hostile behavior extending from mild (35.9%) to severe (8.1%) and lived with their biological parents about (83.9%), which is consistent with the results of Kamphuis et al. as well as with studies by Rahayu and Putera, which ex-

amined the relationship between hostile behaviors with some habits among school-age children [23, 24].

Finally, the study confirmed the importance of studying hostility as a problem needed to treat children in this age group because it has profound impacts on the child in the future and on parents and society in the present; many factors may arise from this behavior among children, such as psychophysical indicators, which have a significant effect on exhibiting hostile behavior when the child has psychological and physical health problems. Also, the severity of hostile behavior among children when they are exposed to bullying or family neglect should be considered. Moreover, hostile behavior increases when a child has many problems with psychophysical indicators. On the other hand, this issue is not only in Iraq, but worldwide. Other factors can be attributed to the increase in hostile behavior, such as lack of parental nurturing and educational systems, life stresses, and modernization aspects, such as social media, video games, and non-purposeful movies. This result is consistent with that reported by Owens et al. [25].

Conclusion

This study concluded that more than half of the children had symptoms of hostile behavior and had problems with overall psychophysical indicators; however, some indicators were normal, such as BMI percentile, heart rate, breathing, and cognitive and movement indicators. Also, the study concluded that when psychophysical indicators are poor or abnormal among children, the severity and symptoms of hostile behavior increase. The study recommends increasing parents' awareness of mental health by teaching them how to nurture their children and integrating programs in the education system, especially in the primary school curriculum, how to control the child's anger, and accepting a situation that triggers hostile behavior and prevents it.

Ethical Considerations

Compliance with ethical guidelines

This study was approved by the Ethics Committee of College of Medicine, University of Kufa, Kufa, Iraq (Code: MEC-0081-2023). After receiving the study's title, objectives and questionnaire, the medical Ethics Committee evaluated and approved the study's instruments (questionnaire). The study was conducted by the Declaration of Helsinki.

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Authors' contributions

Investigation, data collection and writing the original draft: Zahra Anwar Fadhel; Conceptualization: Astabrak Ali Naji; Final approval: All authors.

Conflict of interest

The authors declared no conflicts of interest.

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