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Awareness of Sustainable Development Goals and Its Relationship to Sustainable Behavior

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Abstract

The aim of the current study is to measure the awareness of middle school female students towards the Sustainable Development Goals (SDGs) and their orientation towards sustainable behaviors. The study also aims to find the relationship between awareness of SDGs and orientation towards sustainable behavior. The study followed a correlational descriptive methodology, utilizing a questionnaire developed by the researcher, which was administered to a sample of 375 middle school female students. The study results revealed that the level of awareness of Sustainable Development Goals (SDGs) among middle school female students achieved a moderate level with a weighted mean of 3.26 and a standard deviation of 0.74. Similarly, the orientation towards sustainable behavior among middle school female students was also rated as moderate, with a weighted mean of 3.37 and a standard deviation of 0.34. The dimension of Altruism attained the highest score among the dimensions and was the most prevalent among the study sample, achieving a high weighted mean of 3.56 with a standard deviation of 0.54. Following it, in the second position, was the dimension related to Fairness and Justice with a weighted mean of 3.40 and a standard deviation of 0.65, also achieving a moderate score. In the third position, the dimension of Environmentally Supportive Behaviors attained a moderate score with a weighted mean of 3.26 and a standard deviation of 0.50. Furthermore, the results indicated a statistically significant positive correlation at a significance level of 0.01 between the awareness of Sustainable Development Goals (SDGs) among middle school female students and the degree of orientation toward sustainable behavior. Based on these results, it is recommended to develop clear plans based on Sustainable Development Goals (SDGs) to encourage students to adopt sustainable behaviors. Additionally, it is suggested to utilize the scale used in designing counselling programs to promote sustainable behavior. Furthermore,

further studies aiming to investigate the impact of sustainable behaviors on psychological well-being and satisfaction among school students are proposed.

Subject Areas

Sociology, Statistics

Keywords

Sustainable Development, Sustainable Behavior, Middle School Students, Saudi Arabia

1. Introduction

Psychology, like other branches of scientific knowledge, has been one of the disciplines that have focused on human behaviour since its emergence and development in the late 19th century. It considers human behaviour as the outcome of the relationship between individuals and their external environment, as well as their internal environment, known as individual psychology. Therefore, it is rare to find a definition of psychology from its inception until now that does not include the term environment (Al-Shafei & Al-Omari, 2021) [1]. Amid the increasing population growth facing many countries around the world, which has negatively impacted the depletion of energy and resources, coupled with climate variability, poverty, unemployment, illiteracy, epidemics, and other threats, directly and indirectly, affecting individuals and the planet, increasing psychological pressures, the concept of sustainable development has emerged to sustain life and natural resources to serve both current and future generations (Dammas, 2020) [2]. Psychology has shown interest in the dynamic perspective of the relationship between individuals and their environment, emphasizing the mutual interaction between them and the role of psychological processes mediating this interaction. Environmental behaviour is part of an individual's general behaviour acquired through family, school, and various community institutions (Abdel-Messiah & Faraj, 2002) [3].

Al-Arabi (2018) newspaper, Christie Manning, an expert in psychology and environmental studies, explained that many individual decisions are automatic and unconscious. Thinking results from two separate systems: one conscious, based on a reasoned logical basis, carefully making decisions according to evidence and facts, while the other is unconscious, irrational, and beyond control. It is driven by the individual's emotions and feelings or by others, and these two systems operate in balance but are not in agreement. Manning, the author of the book (Sustainability Psychology), published in 2016, provided a set of tips for transitioning towards sustainable lifestyles, including promoting sustainable behaviour at the community level, emphasizing personal relationships, and acquiring cognitive skills that facilitate sustainable behaviour (Al-Tayton, 2018)

[4]. Currently, there is an increasing trend in integrating new technologies, methods, and educational strategies within the framework of national policies for sustainable development, which serve as guidelines for individual and societal behaviour. Therefore, the prominent trend in Europe is to consider sustainable behaviour as the outcome of a broad learning process and education (Hezlinck, 2000) [5]. Achieving sustainable behaviour is not solely accomplished through technological means; rather, it requires a change in individuals' own thinking and actions. This change can be achieved through integrating education for sustainable development starting from childhood and continuing through higher education. Real development is the one that enhances cognitive abilities, innovation, capacity for exploration, and invention (UNESCO, 2021) [6].

It can be said that sustainable behaviour is an equation linked to repairing the conscience and enhancing moral values in the holistic dimension of human behaviour. It is a shared responsibility for social, political, religious, and environmental figures and thinkers in the humanities. Without the availability of such effort, discussing sustainable behaviour is a mere fantasy (Al-Wadai, 2022) [7]. Sustainable development and achieving sustainable behaviour are based on a policy of lifelong continuous learning. In an era characterized by rapid development, students cannot survive with a limited set of skills and knowledge. Therefore, it is necessary to equip students with skills that enable them to continuously grow throughout their lives (Al-Anzi, 2021) [8]. Education contributes to promoting sustainability goals in cognitive, social, emotional, and behavioural fields. This requires providing suitable objectives for integrating education for sustainability in all formal and informal educational environments, ensuring their consistency with each other to bring about the desired change in human behaviour (UNESCO, 2021, p. 2) [6]. Environmental psychology theories, a branch of general psychology concerned with the mutual relationship between individuals and their environment, have affirmed that our thoughts and behaviours are influenced by our natural or artificial surroundings, and in turn, they influence them. Therefore, this field of study focuses on researching the best behavioural practices that involve improving our relationship with the surrounding environment (Al-Shafei & Al-Omari, 2021) [1]. The middle school stage is considered one of the most important educational stages in shaping the student's personality to achieve psychological and social harmony. This requires awareness of the events happening around them, leading them to confront challenges with sustainable and effective positive responses, in an environment characterized by psychological and emotional stability (Al-Ashmawy, 2019) [9]. Studies and psychological theories that have investigated sustainable behaviour have highlighted the importance of the emotional aspect in encouraging individuals to adopt sustainable activities. Strengthening emotional attachment and a sense of environmental belonging enhances individuals' desire to avoid negative behaviours and focus on sustainable ones. This is evident in studies such as those conducted by Berenguer (2007) and Cummings (2010).

The researcher found, through her fieldwork in one of the middle schools, a

low level of sustainable behaviours among the female students. Therefore, she conducted this study on a sample of middle school female students to measure their awareness of Sustainable Development Goals (SDGs) and their relationship with their sustainable behavioural practices. From this point of view, we can identify the problem of the study in three questions:

- What is the level of awareness among middle school female students regarding Sustainable Development Goals (SDGs)?
- What is the level of orientation of middle school female students towards sustainable behaviour?
- Is there a statistically significant relationship between the level of awareness among middle school female students regarding Sustainable Development Goals (SDGs) and their orientation toward sustainable behaviour?

2. Objectives

The current study aims to: establish the relationship between middle-school students' awareness of sustainable development goals and the orientation towards sustainable behaviours.

2.1. The Importance of the Current Study Lies in Two Aspects

Theoretical importance: The Arab Library can be enriched by theoretical and cognitive information about the sustainable development and behaviour variable, because of the paucity of research on the sustainable behaviour variable - as far as researchers know and familiarize themselves with Arab databases - which is an important and vital subject within the framework of national sustainable development policies and which serve as guides for individual and community behaviour.

As well as the importance of the target group, where the study targets adolescence and is one of the age stages at which an individual's personality is formed and cognitive components are built, to achieve psychosocial compatibility. This study may also contribute to the realization of Saudi Arabia's Vision 2030 in its direction toward the achievement of sustainable development goals and highlight contemporary global trends toward the need for sustainable behaviour in all areas.

Its practical importance: It may help to provide a new measure of awareness of development goals and a direction towards sustainable behaviour among middle-level students, since, within the research's knowledge, there is no Arab measure of sustainable behaviour, and it can also benefit professionals and educators in designing appropriate prevention and treatment programmes to reduce unsustainable behaviour that is harmful to the environment and society.

3. Study Terminology

3.1. Sustainable Development

Linguistcally, sustainable refers to growth, proliferation, and flourishing, all in-

dicating increase, abundance, and multiplication (Al-Mu'jam Al-Wasit, 2008). This term is rooted in the ancient Latin word Sustenere, which means preservation, retention, and maintenance of use to keep something going (Abdul Ghani, 2020) [10].

Abu Nasser and Mohammed (2017) [11] define it as: continuous, balanced and just development that takes into account the environmental dimension in their projects, while taking care of the needs of future generations. Al-Azzawi (2016) [12] states that it is an abstract quantitative change, in a particular society; With the aim of giving that community a capacity for continuous self-development to ensure improvement in the quality of life for all its members. Al-Muneer (2015) [13] defined it as development that meets the needs of today's individuals, without causing any harm to future generations.

From what the researcher defines as a procedural awareness of sustainable development

She understood and recognized the call of societies to achieve the 17 goals set by the United Nations World Organization to save the world and balance the needs of the present and the future. This awareness of the student's performance level is measured in the grades prepared by the researcher for this purpose.

3.2. Sustainable Behavior

The conduct is defined linguistically as a total response by the organism to a situation it faces.

Bonnes *et al.* (2002) [14] is defined as a set of vital activities with impacts that contribute to the preservation of an individual's physical and social environment. Najera (2010) [15] considers that it is intentional behaviour that represents a set of effective actions that respond to society's and individual's requirements to protect the environment and promote quality of life.

It can also be defined as a lifestyle based on the best use of services and products that respond to basic needs, and achieve a better quality of life, so that it does not threaten the needs of future generations (Oslo, 1994) [16]. From what the researcher defines as procedurally sustainable behaviour: Self-conscious and deliberate behaviour by the student in order to reduce the negative effects of human behaviours in the world, manifested through pro-environmental behaviour, equity, rationalization and altruistic behaviour. These behaviours are measured by the student's level of performance in the grades prepared by the researcher for this purpose.

3.3. Middle School Students

Students aged 12 to 15.

3.4. Saudi Arabia

An Arab country located north-west of the Asian continent.

4. Literature Review

4.1. Sustainable Development Goals and Achieving Sustainable Behavior

Increasing awareness of the importance of sustainable development and the historical evolution of its concept has brought it into the spotlight worldwide, complicating its goals as it seeks a better life for future generations. This necessitates a change in developmental thinking. In 2015, all United Nations member states adopted the seventeen Sustainable Development Goals (SDGs), known as the Global Goals. These goals call for action to end poverty, protect the planet, and ensure that all people enjoy peace and prosperity by 2030 (See Figure 1). The SDGs are characterized by integration and balance; any action in one area affects outcomes in other areas, whether social, economic, environmental, or technological. The United Nations sees the SDGs as achieving economic growth, social and economic justice, efficient use of all resources, and preserving natural and environmental resources for future generations (Abu Al-Nasr & Mohammed, 2017) [11].

4.2. Psychology of Sustainable Behaviour

Enhancing sustainable behaviour presents a unique challenge, as sustainability is an outcome that is difficult to quantify and relies on proactive behaviour by many. The critical issue involves the fact that the natural behaviour of many is unsustainable.

Figure 1. Illustrates the sustainable development goals for the Kingdom of Saudi Arabia in its vision 2030.

An individual's behaviour, personality, formation, growth, conduct, inclinations, and thoughts are all products of their environment and interactions with it. Any erroneous behavioural patterns towards the environment constitute unsustainable and unbalanced behaviour. These negative behaviours represent an assault on the environment and may be caused by various factors, including psychological factors, physiological disturbances such as conflict, frustration, negative experiences, habitual stress-inducing patterns, intrusion on personal and spatial boundaries, lack of environmental knowledge, and the social environment in which the individual resides. The relationship between human behaviour and the environment is reciprocal and interactive. Humans influence the environment as they attempt to adapt to it, while the environment also affects human life, either limiting or encouraging behavior. There are impacts on human psychological and mental health, emotional state, and productivity, and these effects vary from one situation to another and according to individual differences. Many psychological studies on sustainable behavior have shown the psychological impact of adopting sustainable behaviors by individuals, such as the Brown study (2005) and the Bickel study (2010), which resulted in findings indicating that individuals who exhibit more sustainable behaviors tend to experience greater happiness compared to those with unsustainable behaviors. This happiness stems from feelings of satisfaction, enjoyment, positive well-being, and a sense of purpose and value in life (Tapia-Fonllem& et. Al, 2013) [17].

4.3. Theoretical Frameworks and Models Explaining Sustainable Behavior

Theories and models explaining human behaviour and its impact on the surrounding environment are diverse, including the following:

4.3.1. Planned Behaviour Theory

One of the most famous theories explaining behaviour is the Theory of Planned Behaviour, developed by the scientist Icek Ajzen in 1991 as an extension of his earlier Theory of Reasoned Action. In this theory, Ajzen pointed out that an individual's ability to control their behaviour is proportional to their motivation to achieve that behaviour, as well as their self-efficacy (Saad, 2021) [18]. Based on this theory, understanding individuals' intentions and motivations helps predict sustainable and responsible behaviours at the individual level. Attitudes, behavioural beliefs, perceived norms, and perceived behavioural control together form behavioural intentions, and thus individual behaviour (Zhao, *et al*., 2022) [19].

4.3.2. Social Role Theory

One of the modern theories that emerged at the beginning of the twentieth century and was studied by scholars such as Max Weber, Talcott Parsons, Hans Kierth, Mills, and MacIver, is Social Role Theory. This theory suggests that an individual's behaviour and social relationships depend on the social role they

occupy in their society. This role earns them a status and position among others. Weber pointed out the possibility of predicting an individual's behaviour by understanding the social role they occupy (Saghier, 2021) [20]. In light of this theory, we can say that individuals who occupy high social roles and positions in society are more aware, and it is expected that they would serve as role models for others and behave with a sense of responsibility and sustainability.

4.3.3. Social Exchange Theory

Emerging in the mid-20th century, key figures in this theory include Kelly, George Homans, Peter Blau, and Thibaut. This theory views life as an interactive and reciprocal process between two parties, where each party both gives and receives rather than solely taking or giving. This exchange of giving and taking leads to the sustainability of the interactive relationship. However, this relationship becomes strained if there is an imbalance between giving and taking among the parties involved, much like the interaction between an individual and their environment (Saghir, 2021) [20]. Based on this theory, it can be argued that individuals who fulfill their needs from the environment they live in are supposed to be more thoughtful when facing situations that could negatively impact their environment. They are aware that any harm to the environment will have negative consequences for them. Consequently, they tend to be more concerned about their behaviours towards the environment on which their interests depend. Conversely, we find that the less benefit they receive, the less they care. This is evident in the case of the impoverished class, who do not obtain from the environment what satisfies their hunger or some of their needs, so they do not pay attention to their behaviours towards the environment around them (Al3loom, 2021) [21].

4.3.4. The Human Needs Theory

The hierarchy of needs theory, according to Maslow, places physiological needs at the base of the pyramid, followed by the need for safety, then the need for love and belonging, then the need for esteem, and at the top of the pyramid comes the need for self-actualization. According to this theory, individuals may perceive physiological needs as both the base and the top of the hierarchy. Therefore, some unsustainable behaviours that contribute to environmental pollution, such as seeking food and money, may be viewed through this lens. This can be clearly observed among farmers who use pesticides that harm the environment but increase crop yield. Additionally, in affluent or middle-class layers that possess a level of awareness and culture, the use of organic foods, respect for the surrounding environment (both natural and human), and consideration of rights are seen as meeting the need for group appreciation, self-esteem, and self-respect, in addition to satisfying physiological needs first (al3loom, 2021) [21].

4.3.5. Model Hungerford & Volk (1990) for Responsible Environmental Behaviour - Sustainable Behaviour

Presented by both Hungerford and Volk, this model looks at the role of

non-formal programs for students in bringing about positive changes in their beliefs, attitudes, personal responsibility, and awareness of social and environmental issues. The model highlights the role of awareness and knowledge as a prerequisite for sustainable behaviour change. Accordingly, the model emphasizes the role of knowledge as a precursor to intention and the formation of responsible and sustainable behaviour.

4.4. Previous Studies

Several studies have addressed the Sustainable Development Goals (SDGs) and sustainable behaviour, as well as their relationship with other variables. However, based on the researcher's knowledge, no Arabic study has been found that examines the relationship between these variables.

In a study conducted by Michael *et al.* (2019) [22] to assess students' awareness and behavioural practices regarding the Sustainable Development Goals (SDGs) in Malaysia, a questionnaire based on the UNESCO Learning Objectives was developed. A total of 507 university students participated in the study, and an analytical descriptive method was employed. The results indicated that 40.7% of the students lacked sufficient knowledge of sustainable development. Furthermore, the study revealed that final-year students exhibited a higher level of sustainability awareness compared to students in the first and second years. The study recommended disseminating sufficient information about sustainable development to raise students' awareness through formal education. In a study conducted by Al-Ba'aj, R.M. (2019) [23] to assess the extent of understanding of sustainable development concepts among female middle school students, a descriptive-analytical approach was used. The study sample consisted of 200 students (100 in the first year of middle school and 100 in the third year) randomly selected from some middle schools affiliated with the Education Directorate of Baghdad/Al-Karkh 3. The researcher prepared a questionnaire consisting of 24 items and administered it to the participants. The study results indicated that female middle school students lack knowledge of sustainable development. Furthermore, statistical differences were found between first and third-year students, with the third-year students showing higher levels of awareness. In light of these findings, the researcher recommended the adoption of principles and goals of education for sustainable development in the school curriculum to introduce students to sustainable development. Additionally, the study suggested leveraging the experiences of other countries and emphasized the importance of collaboration between educational and media institutions to clarify the significance of sustainable development for communities. Furthermore, it recommended training teachers on how to use educational materials to explain the concept of sustainable development to students, taking into account the learners' ages.

In 2021, Al-Omari conducted a study aiming to assess the level of awareness among university students about the Sustainable Development Goals (SDGs) titled Awareness and Understanding of Scientific College Students at Yarmouk

University of the Sustainable Development Goals 2030 and Faculty Members' Utilization of them in Light of Some Variables. The sample consisted of 124 teaching staff members and 702 male and female students. The study utilized a descriptive-analytical approach. The researcher prepared the following tools: a questionnaire to measure the degree of faculty members' utilization of the SDGs, a questionnaire to measure students' awareness of the SDGs, and a test to measure students' understanding of the SDGs. The results showed an increase in students' awareness of the SDGs, alongside a decrease in students' understanding of them. The degree of faculty members' utilization of the goals was found to be moderate. The study recommended the university's adoption of the SDGs and their integration into the educational process. The study by Jesse & Eric (2015) [24] aimed to determine the effectiveness of an interactive website providing multi-source feedback on motivating students to change their behaviours towards sustainability or their values, or aligning between them. Based on the principle that creating cognitive dissonance between individuals' values and behaviours tends to encourage them to balance between daily behaviours and declared values, the platform works to increase students' awareness of individual sustainability. This study utilized a unique multi-source feedback platform developed by three teaching bodies at James Madison University, as well as a sustainable personality survey platform. Continuous research showed that when conducted effectively, the feedback process can lead to significant changes in students' awareness, behaviours, and values after the study, although few of them indicate a greater alignment between their values and behaviours. The study recommended the provision of multi-source platforms and applications, both in academic environments and in governmental, non-profit organizations, and other organizations that measure growth and success for social change, which starts with individual change. In a study by Tapia-Fonllem *et al*. (2013) [17], which involved constructing a scale for sustainable behaviour and verifying its validity and reliability in measuring sustainability-supportive behaviours, the researchers adopted a descriptive-analytical methodology. They administered a questionnaire to a random sample of students and professors from four universities in Mexico, totalling 807 individuals, with 52% females and 47% males, ranging in age from 18 to 44 years old. The study's results indicated a correlation between the four factors of the scale (environmentally supportive behaviour, altruism, economy, and fairness). The scale also demonstrated good stability (0.79) and construct validity between its factors ranging from 0.39 to 0.85 at a significance level of 0.01, indicating acceptable levels of reliability and validity.

General Comment on Previous Studies

Through reviewing some previous studies that addressed sustainable development and sustainable behaviour, while there is an agreement between the current study and previous studies in addressing the awareness of sustainable development goals and sustainable behaviour change, the current study differed from previous studies in that it aimed to shed light on the relationship between

awareness of sustainable development goals and the inclination towards sustainable behaviour among middle school female students. The researcher benefited from previous studies in identifying the appropriate research methodology for conducting this type of study, as well as in constructing the appropriate scale, and confirming the problem of the study and the need for its implementation; by utilizing the results and recommendations of some previous studies.

5. Methodology

5.1. Study Methodology

A descriptive correlational methodology was adopted to determine the level of awareness of sustainable development goals and the inclination towards sustainable behaviour among a sample of female students in middle schools.

5.2. Study Population

The study was conducted, and its results were extracted and interpreted within a set of limitations, which included human limitations, represented by the sample of middle school students. Temporal limitations were also present, as the study was conducted in the year 2023. As for spatial limitations, the study was conducted in the city of Tabuk, Saudi Arabia.

5.3. Study Sample

The study population consists of female middle school students in both government and private schools in the city of Tabuk, Saudi Arabia.

5.4. Study Sample

The study sample consisted of 375 students randomly selected from middle school students in both public and private schools in Tabuk City.

5.5. Study Tools

The researcher reconstructed a measurement tool to assess awareness of sustainable development goals and the inclination towards sustainable behaviour due to the absence of a suitable scale that meets the study's needs. This was done after reviewing relevant literature and scales related to sustainable behaviour. The study referenced Tapia-Fonllem *et al.* (2013) [17] in developing the dimensions of the scale, based on four dimensions: environmentally supportive behaviour, justice and fairness behaviour, conservation behaviour, and altruistic behaviour. The researcher utilized the translated Arabic version of the scale's items, adapting them to fit the study's objectives, sample characteristics, and age group. The researcher also relied on the study by Al-Omari Farouk (2021) [25] in developing the axis of awareness of sustainable development goals, consisting of 17 goals set by the United Nations. Additionally, the researcher benefited from the development of items for the altruistic behaviour dimension from the Altruistic Behaviour Scale used in the study by Dabaybeh, Naseeb (2009) [26].

5.5.1. Scale Description

The questionnaire in its initial form consisted of 42 items distributed across two axes. The first axis measured the awareness of the students towards sustainable development goals, comprising 17 positively worded items. The second axis gauged the students' inclination towards sustainable behaviour, consisting of 25 positively worded items divided into four dimensions: environmental supportive behaviours, conservation attitudes, altruism, and justice and fairness. The scale was administered in its initial form to 375 female students as a pilot study. Additionally, it was presented to 15 experts to assess the relevance of the items to sustainable behaviour, as well as to evaluate the clarity and accuracy of the items in measuring the intended constructs. Through arbitration and the pilot study, items with low-reliability coefficients were deleted. These included items numbered 6, 12, and 16. Additionally, items with unclear wording were revised. For instance, item number 5 was modified to: (I am aware that harming wild and marine animals is a negative behaviour). Item number 14 was amended to:(I often use e-books instead of paper ones to prevent paper waste and consumption). Furthermore, item number 24 was changed to: (I believe that males and females should have equal educational opportunities). Additionally, some positive statements were changed to negative ones to reduce response bias in the scale items. For instance, the second item in the dimension measuring awareness of sustainable development goals was modified to: (From my perspective, this goal is not of national importance). Similarly, items numbered 1, 7, 10, 11, 19, and 23 in the dimension of sustainable behaviours were altered to negative statements.

5.5.2. The Final Version of the Scale

The final questionnaire consisted of 39 items divided into two axes as follows: The first axis: Awareness of sustainable development goals, consisting of 17 objectives. Each objective includes two statements, one of which is negative. The second axis: Orientation towards sustainable behaviour, consisting of 22 statements, divided into four dimensions:

1) Environmental supportive behaviours: It includes 6 items, with 2 negative items.

2) Conservation behaviours: It includes 6 items, with 2 negative items.

3) Altruistic behaviours: It includes 5 items, with 1 negative item.

4) Fairness and justice behaviours: It includes 5 items, with 1 negative item

A five-point Likert scale was used as follows: (Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree) to respond to the items of the scale.

5.5.3. Correction Key

The correction key was based on a Likert five-point scale, where the scores were assigned as follows:

For positive statements:

Strongly Agree = 5, Agree = 4, Neutral = 3, Disagree = 2, Strongly Disagree = 1.

And for negative statements:

Strongly Agree = 1, Agree = 2, Neutral = 3, Disagree = 4, Strongly Disagree = 5.

6. Results

6.1. Psychometric Properties of the Sustainability Behaviour Orientation Scale in the Current Study

Scale Validity: The validity of the scale was assessed by presenting it to a group of 15 expert reviewers specialized in psychology, educational measurement, and psychology. The final version consisted of 39 items. The reviewers recommended changing one of the items in the awareness of sustainable development goals dimension to be negative. Additionally, three items were deleted as the reviewers agreed they were not relevant to the dimension measured in the sustainability behaviour orientation axis, reducing the scale to 22 items. Furthermore, the wording of the six items was changed from positive to negative. The validity of the items was assessed by calculating the Pearson correlation coefficient for each item within its respective dimension of the scale and the total score of that dimension to determine internal consistency. The results are presented in Table 1.

Table 1 indicates that all Pearson correlation coefficients resulting from examining the relationship between sustainable development goals and the total score of the first section are significant at the 0.01 and 0.05 levels. They ranged between 0.49 and 0.79. In the second section of the scale, the corrected correlation coefficients for dimensions of sustainable behaviour orientation ranged between 0.42 and 0.79, indicating the acceptability of the validity of the scores of sustainable behaviour scale items. Additionally, the internal consistency reliability of the dimensions and the total score of the scale was verified, as shown in the following Table 2:

Table 1. Pearson correlation coefficients for items of the sustainable behavior orientation scale with total score of respective dimension (Sample Size: n = 375).

Section I: Awareness of Sustainable Development Goals	Objectives	1	2	3	4	5	6	7	8	9
	Binding coefficient	0.79**	0.69**	0.48**	0.57**	0.79**	0.66**	0.64**	0.78**	0.74**
	Objectives	10	11	12	13	14	15	16	17	
	Binding coefficient	0.56**	0.79**	0.76**	0.71**	0.71**	0.57**	0.79**	0.58**	
	Pro-environment behaviours	Ferry Number			1	2	3	4	5	6
										0.53**
Section I: Awareness of Sustainable Development Goals	Rationalization Behaviors	Binding coefficient			0.68**	0.74**	0.79**	0.53**	0.79**	
		Ferry Number			1	2	3	4	5	6
	Altruism behaviors	Binding coefficient			0.76**	0.49**	0.63**	0.67**	0.52**	
		Ferry Number			1	2	3	4	5	0.43*
	Equity and Justice	Binding coefficient			0.77**	0.78**	0.42**	0.67**	0.68**	
		Ferry Number			1	2	3	4	5	

Table 2. Pearson correlation coefficients of the dimensions of the sustainable behaviour orientation scale with the total score of the Scale (Sample Size: n = 375).

Dimensions	Correlation coefficient value
Pro-environment behaviours	0.85**
Rationalization Behaviors	0.79**
Altruism behaviors	0.87**
Equity and Justice	0.76**

Table 3. Cronbach's Alpha coefficient values for the dimensions of the sustainable behaviour orientation scale and the total scale (n = 375).

Dimensions	Number of items	Cronbach's Alpha Coefficient Value
Awareness of sustainable development goals	17	0.93
Pro-environment behaviours	6	0.81
Rationalization Behaviors	6	0.70
Altruism behaviors	5	0.77
Equity and Justice	5	0.70
	39	0.88

From Table 2, it is evident that all correlation coefficients between the dimensions of sustainable behaviour orientation and the total score of the scale are significant at the 0.01 level, indicating the reliability of internal consistency of the scale. The correlation coefficients ranged between 0.79 and 0.87, suggesting that the scale achieved a good level of internal validity and suitability for achieving the study's objectives.

6.2. Reliability Analysis

The reliability of the scale for all its items was verified after its application to the survey sample, and then the coefficient alpha (Cronbach's alpha) value was calculated for each dimension and for the overall scale, as shown in the following Table 3.

The table above (Table 3) shows that the Cronbach's alpha coefficient values for the awareness of sustainable development goals recorded a value of 0.93, while the values of the Cronbach's alpha coefficient for the dimensions of sustainable behaviour orientation ranged between 0.70 and 0.81. The Cronbach's alpha coefficient value for the total scale was 0.88. This indicates that the scale and its components enjoy a sufficient degree of stability, and are valid for achieving the study's objectives.

7. Discussion

7.1. The Result of the First Question and Its Interpretation and Analysis: Which Asks, What Is the Level of Awareness among Middle School Female Students Regarding Sustainable Development Goals?

To answer this question, the weighted means and standard deviations were cal-

culated for the Sustainable Development Goals scale. Accordingly, the range was calculated as follows:

The range equals the largest value in the mean minus the smallest value in the mean.

According to the Likert scale applied in the measurements of this study, responses are classified as follows:

- Mean scores ranging from 5 to 4.21 fall within the category of very high.
- Mean scores ranging from 4.20 to 3.41 fall within the category of high.
- Mean scores ranging from 3.40 to 2.61 fall within the category of moderate.
- Mean scores ranging from 2.60 to 1.81 fall within the category of weak.
- Mean scores ranging from 1.80 to 1 fall within the category of very weak.

Based on this, the results are shown in Table 4:

From the previous Table 4, it is evident that the level of awareness of sustainable development goals among middle school students achieved a moderate level with a weighted average of 3.26 and a standard deviation of 0.74. The second goal (eradicating hunger) achieved the highest score among the goals and was the most common among the study sample, achieving a high weighted average of 3.80 with a standard deviation of 0.99. Following closely in second place is the goal related to quality education, with a weighted average of 3.73 and a standard deviation of 0.78, also achieving a high score. In third place, the goal of eliminating poverty achieved a high score with a weighted average of 3.70 and a standard deviation of 0.64. As the least common goal, the seventeenth goal (partnerships for the goals) achieved a low weighted average of 2.50 with a standard

Table 4. Descriptive statistics for students' awareness of sustainable development goals (N = 375).

Objectives	Weighted average	standard deviation	Verification degree	Ranking
Eliminate poverty	3.70	0.64	High	The third
Eliminate hunger	3.80	0.99	High	The first
Good health and well-being	3.06	0.90	Medium	eleventh
Good education	3.73	0.78	High	The second
Gender equality	3.10	0.84	Medium	The tenth
Clean water and hygiene	3.40	0.65	Medium	Fifth
Clean and affordable energy	3.26	0.65	Medium	VIII
Decent work and economic growth	3.10	0.84	Medium	The tenth
Industry, innovation and infrastructure	3.00	1.11	Medium	twelfth
Reducing inequalities	2.80	0.76	Medium	Thirteenth
Sustainable cities and communities	3.33	0.84	Medium	VI
Interpreted consumption and production	3.30	0.87	Medium	Seventh
Climate action	3.06	0.86	Medium	eleventh
Life under water	3.66	0.80	High	The fourth
Life on land	3.40	0.65	Medium	Fifth
Peace, justice and strong institutions	3.23	0.76	Medium	Ninth
Establishing partnerships to achieve goals	2.50	1.33	Weak	fourteenth
Total marks	3.26	0.74	Medium	

deviation of 0.74, indicating a weak score. This result is consistent with the study by Michael *et al*. (2019), despite the differences in the environment and educational stage, as their study targeted university students. It also aligns with the findings of Al-Ba'aj, Ru'aa (2019) [23], which revealed a lack of awareness among middle school female students regarding sustainable development goals. However, it contradicts with the study by Al-Omari and Farouk (2021) [25], which targeted students at Yarmouk University and found an increase in awareness among students regarding sustainable development goals but a decrease in their understanding of these goals. The difference in results could be attributed to the age group of the study sample.

7.2. The Results of the Second Question and Its Interpretation and Analysis, Which Asks, What Is the Level of Middle School Female Students' Orientation towards Sustainable Behaviour?

To answer this question, the weighted means and standard deviations were calculated for the Sustainable Behaviour Orientation Scale, following the same range equation as in the previous question. The results are as follows **Table 5**.

The preceding table shows that the overall score of the Sustainable Behaviour Orientation Scale among middle school students achieved a mean of 3.37, indicating a moderate level, with a weighted average and a standard deviation of 0.34. The dimension of Altruism achieved the highest score among the dimensions and was the most prevalent among the study sample, with a score of 3.56, indicating a high level, with a weighted average and a standard deviation of 0.54. Following it in second place is the dimension related to Fairness and Justice with a weighted average score of 3.40 and a standard deviation of 0.65, achieving a moderate level. In third place, the dimension of Pro-environmental Behaviours obtained a moderate score, with a weighted average of 3.26 and a standard deviation of 0.50. As the least prevalent dimension, the Conservation Behaviours dimension achieved a weighted average of 3.17 with a standard deviation of 0.60, indicating a moderate level of achievement. Indeed, conservation behaviour is considered a fundamental characteristic of a sustainable lifestyle. Therefore, it can be said that middle school students need to develop positive values that guide them towards a sustainable life in line with their daily behaviours. The previous result can also be interpreted as indicating that sustainable behaviour is the product of one's ideas and interaction with the social environment, as well as cognitive awareness of the environment and sustainable development goals. Result of Question Three, Explanation, and Analysis: This question aims to determine whether there is a statistically significant relationship between the level of awareness of middle school students about sustainable development goals and their attitude towards sustainable behaviour? To address this question, a Pearson correlation test was conducted to examine the relationship between the variables, as shown in the following **Table 6**:

Table 5. Descriptive statistics for the sustainable behaviour orientation scale with its dimensions (N = 375).

Dimensions	Weighted average	standard deviation	Verification degree	Ranking
Pro-environment behaviours	3.26	0.50	Medium	the third
Rationalization Behaviors	3.17	0.60	Medium	the fourth
Altruism behaviors	3.56	0.54	High	the first
Equity and Justice	3.40	0.65	Medium	the second
Total marks	3.37	0.34	Medium	

Table 6. Pearson correlation coefficients to examine the relationship between the level of awareness of middle school students towards sustainable development goals and their attitude towards sustainable behaviour in its dimensions (N = 375).

Orientation towards sustainable behaviorin all its dimensions	Awareness of sustainable development goals
Pro-environment behaviours	0.615**
Rationalization Behaviors	0.396**
Altruism behaviors	0.521**
Equity and Justice	0.570**
Total marks	0.656**

Table 6 indicates a statistically significant positive relationship at a significance level of 0.01 between the awareness level of middle school students towards sustainable development goals and their attitude towards sustainable behaviour in its dimensions. It is evident from the correlation coefficient value for the total score (0.656) (PC ≥ 0.6) that the relationship is strong and inversely proportional. This means that as the awareness level of sustainable development goals increases, the attitude towards sustainable behaviour among middle school students also increases. This aligns with the previous result, consistent with the study by Jesse & Eric (2015) [24], where it was found that an increase in students' awareness of individual sustainability leads to changes in their awareness of development goals and consequently in their behaviors and values.

8. Results

The results of the study can be summarized as follows:

- The awareness level of middle school students towards sustainable development goals achieved a moderate score with a weighted average of 3.26 and a standard deviation of 0.74.
- The overall score for the attitude towards sustainable behaviour among middle school students was moderate with a weighted average of 3.37 and a standard deviation of 0.34. The dimension of altruism attained the highest score among the dimensions, being the most prevalent among the study sample, with a high achievement score and a weighted average of 3.56 and a standard deviation of 0.54. It was followed by the dimension related to fairness and justice with a weighted average of 3.40 and a standard deviation of 0.65, achieving a moderate score. In the third place, the dimension of environmentally supportive behaviours achieved a moderate score with a

weighted average of 3.26 and a standard deviation of 0.50.

- There is a statistically significant positive correlation at a significance level of 0.01 between the awareness level of middle school students towards sustainable development goals and their attitude towards sustainable behaviour.

9. Study Recommendations & the Proposals

Based on the study results, the researcher recommends the following:

- Develop clear plans based on sustainable development goals that contribute to students adopting sustainable behaviours.
- Pay attention to activities related to environmental service in educational institutions to develop sustainable positive behaviour towards the environment and society.
- Utilize the scale used to design counselling programs to promote sustainable behavior.
- Conducting further studies aimed at investigating the impact of sustainable behaviours on psychological well-being and satisfaction among school students.
- Conducting more studies on sustainable development goals and sustainable behaviour in other segments of society.

Conflicts of Interest

The authors declare no conflicts of interest.

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