

Article

Stages of Change and Variation in Weight-Related Behaviors and Physical Activity: The Role of Motivation and Self-Efficacy in Adolescents

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Abstract

The stages of change have been identified as a valuable framework for understanding the transition toward a healthy lifestyle. It is also important to recognize change through other psychosocial variables, such as motivation and self-efficacy. The objective of this study was to explore weight control over the course of an academic year (nine months) through three behaviors: the stage of change toward weight control (pre-contemplation, contemplation, preparation, action, maintenance), healthy and unhealthy eating behaviors for weight control, and the frequency of physical activity (PA). Furthermore, we wanted to ascertain whether the three distinct types of motivation (autonomous, controlled, and amotivation) and self-efficacy could account for fluctuations in weight control over time. The sample consisted of 303 adolescents (205 female and 98 male) between the ages of 15 and 23 ($M = 17.26$; $SD = 1.65$). Chi-square, t -test, and multiple linear stepwise regression analysis were employed. The results indicated that a higher proportion of adolescents were in the precontemplation and action stages at Time 2. Concurrently, an increase in the frequency of moderate-to-vigorous PA and an increase in healthy and unhealthy behaviors were observed during the school period. The present study posits that autonomous motivation, controlled motivation, and self-efficacy can explain healthy eating behaviors for weight control and the frequency of moderate-to-vigorous PA, while only controlled motivation explains unhealthy eating behaviors for weight control. The conclusion of the study points out that healthy behaviors can change over time due to individual regulation of motivation and increased self-perception of efficacy in one's own abilities to perform a specific action to control weight.

Keywords: stages of change; weight-related behaviors; physical activity; motivation; self-efficacy



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1. Introduction

Most adolescents are interested in controlling their weight regardless of their current weight [1,2]. Weight control is defined as the actions and good practices undertaken with the goal of keeping or improve health, avoiding health problems, or achieving an ideal body image [3,4]. However, Haynes et al. [5] emphasize the importance of distinguishing between healthy weight-control strategies (e.g., dieting or exercising to lose weight) and weight-related behaviors (e.g., healthy eating habits and physical activity). This is due to

the fact that healthy weight-control strategies are used in order to lose weight, whereas weight-related behaviors refer to the actions of participants, such as the frequency with which they consume fruits and vegetables and the number of hours of physical activity they engage in each week. These behaviors may or may not be undertaken for the purpose of losing weight. This is of particular significance given the paucity of research in this area, as highlighted by Chae et al. [2], who state that there is a lack of knowledge regarding the mechanisms through which adolescents modify problematic weight-control behaviors and the psychological strategies they employ to effect these changes.

In this regard, the stages of change in the transtheoretical model [6,7] constitute a useful theoretical framework for understanding the adoption of healthy behaviors and an interventionist approach in lifestyle modification programs [8].

The transtheoretical model describes the sequential behavior modification process in an individual, from an unhealthy behavior to a healthy one. This model of intentional change is designed to predict the possible outcomes during the adaptation process of the new acquired behavior. The stages of change are the main construct of the transtheoretical model, which illustrates the sequential progress and series of stages that individuals will progress through for a specific behavior transformation [9]. The five stages of change, as proposed by Prochaska et al. [7] are as follows: pre-contemplation (there is no intention to change behavior in the foreseeable future), contemplation (people are aware that a problem exists and are seriously thinking about overcoming it but have not yet made a commitment to take action), preparation (individuals are intending to take action in the next month and are frequently taking small behavioral changes), action (individuals modify their behavior, experiences, and/or environment to overcome their problems), and maintenance (people work to prevent relapse and consolidate the gains attained during action). These stages are to be undergone by an individual in order to adopt a healthy behavior or to quit an unhealthy one.

The transtheoretical model established that the majority of people are not ready to change their behavior and will therefore not be helped by traditional action-oriented prevention programs. Furthermore, the behavioral change process is complex and may unfold in a sequence of stages, in which individuals typically adapt these different processes of change according to the progress they have made towards changing their behavior [10]. However, there is a limited body of research that the transtheoretical model can utilize to analyze how adolescents control their weight [2,11]. In this case, Chae et al. [2] found that the majority of adolescents in their study were in the precontemplation and contemplation stages, highlighting the importance of adolescent-focused weight-control programs that emphasize the significant factors that help adolescents move through the stages of change. In addition to the lack of studies on adolescents, Mastellos et al. [8] mention that few studies follow up on behavioral change and adequately apply the principles of the stages of change to lifestyle change interventions.

Alongside the stages of change, dietary changes and physical activity are frequently the most prevalent components of lifestyle interventions. Nevertheless, it has been demonstrated that these three components, when considered in isolation, are not sufficient to effect behavioral change [8,12]. The integration of psychological components has been identified as a key strategy to enhance the efficacy of lifestyle modification interventions [13,14]. It is well established that self-efficacy and motivation, two psychosocial variables, can contribute to understanding and improving behavioral change and lifestyle interventions. Self-efficacy, conceptualized as an individual's belief in their own ability to perform a particular action [15,16], has been shown to be one of the most important factors influencing the adoption and maintenance of PA for all populations [17–19]. In addition, evidence has emerged demonstrating its influence on healthy eating and weight-related behaviors [18,20].

For instance, Thunfors et al. [21] and Olander et al. [22] have identified a direct correlation between enhanced self-efficacy and PA, and a greater interest in healthy eating, weight loss, and outdoor recreational activities.

Furthermore, motivation from the perspective of self-determination theory [23] has been well studied in the health field as a primary domain, with physical activity and exercise as a focal target [24,25]. Self-determination theory describes how motivational factors at the individual and social-contextual levels work synergistically to affect changes in motivation-related outcomes in terms of behavior, cognition, and affect. Autonomous motivation has been shown to capture regulatory styles that reflect enjoyment/interest, alignment with one's identity, and perceived usefulness of the target behavior. Controlled motivation captures multiple regulatory styles, reflecting inner pressures and ego involvement as well as external pressures and contingent rewards. Controlled motivation and amotivation have been linked to maladaptive outcomes, including health behavior dropout and psychological ill-being [23,25]. Conversely, autonomous motivation has been identified as a significant predictor of weight control, weight maintenance, physical activity, eating regulation, and the use of healthy behaviors for controlling weight [14,18,26–28].

However, research concerning the application of the transtheoretical model, self-efficacy, and motivation in adolescents is limited. In the context of the application of the transtheoretical model and motivation in adolescents, Boff et al. [11] found that, following the conclusion of a lifestyle intervention including the transtheoretical model and a self-determination perspective, a group of adolescents with obesity showed increased motivation to exercise regularly and improve eating habits, as well as a mean overall weight loss. In another study, Eisenberg et al. [29] found that controlled motivation for healthy eating was associated with disordered eating behaviors among adolescents with type 1 diabetes. The researchers demonstrated that self-efficacy could modify this association, concluding that motivation and self-efficacy for healthy eating represent potential intervention targets to reduce disordered eating behaviors in adolescents with type 1 diabetes. Also, Marentes-Castillo et al. [18] found that healthy eating and weight self-efficacy is a variable that is related to healthy and unhealthy weight-control behaviors, through autonomous motivation, controlled motivation and amotivation. Recent studies have demonstrated the applicability of self-efficacy in explaining and predicting behaviors related to weight control [30], and motivation as a key factor in the consolidation of active habits that become sustainable over time [31].

In this regard, the literature described above highlights a significant gap in knowledge about how adolescents engage in weight-related behaviors, the psychological variables involved in the management of such behaviors, and the lack of follow-up studies on behavioral change. The present study aims to address this gap by exploring the process of weight regulation in Mexican adolescents through the lens of stages of change and psychosocial variables. This population has been scarcely studied despite facing a pressing public health need, making this research a novel and relevant contribution to the field. In accordance with the aforementioned gap, the present study has two main objectives: (1) To explore the stages of change in weight control, as well as healthy and unhealthy weight-control behavior, and how the total physical activity and moderate-to-vigorous physical activity of a group of adolescents and young adults change over the course of an academic year. (2) To evaluate the extent to which healthy eating and weight self-efficacy, in conjunction with the three types of motivation (autonomous motivation, controlled motivation and amotivation), measured at the beginning of the academic year can explain total physical activity, moderate-to-vigorous physical activity, and healthy and unhealthy weight-control behavior at the end of the academic year in a group of adolescents and young adults.

Based on the literature review, the following hypotheses were formulated for the present study: (H₁) It is expected that the stages of change related to weight control, healthy and unhealthy weight-control behaviors, and total physical activity and moderate-to-vigorous physical activity levels will change over the course of an academic year. Furthermore, (H₂) it is considered that healthy eating and weight self-efficacy may explain weight-related behaviors at the end of this period. Finally, (H₃) it is hypothesized that the type of motivation for weight control—autonomous, controlled, or amotivation—will also influence weight-related behaviors at the end of the academic year.

2. Materials and Methods

2.1. Study Design

The research design adopted a quantitative, non-experimental approach. The study design was longitudinal, with pre- and post-measurements taken over a period of nine months during an academic year.

2.2. Participants and Procedure

The sample comprised 303 adolescents (205 females and 98 males) between the ages of 15 and 23 ($M = 17.26$; $SD = 1.65$) from Mexico. The participants were high-school students in their final year and in preparatory courses for university admission who were selected through cluster and purposive sampling in five public and private schools from urban areas across the country. There were no missing values in this study.

Schools from different regions of Mexico were selected for participation in the study. Authorization was obtained from school principals, and informed consent was secured from participants and their legal guardians (for those under 16) following a detailed explanation of the study's purpose. The principal investigator, with the support of the University of Valencia (Spain), initiated contact with participating schools via email. The email communications were directed to school coordinators and principals in Mexico. Upon confirmation of participation, each institution appointed a coordinator responsible for organizing the data collection sessions in collaboration with the trained research team. These coordinators maintained ongoing communication with the principal investigator, who also supervised the sessions remotely. When unforeseen circumstances arose, sessions were rescheduled with prior notice. Two waves of data collection were conducted: the first in March 2022 and the second at the end of the academic year, in November of the same year. The study was conducted in accordance with international ethical guidelines consistent with the American Psychological Association. The procedures involving participants in the research study were approved by the Commission on Ethics in Experimental Research of the University of Valencia (Ref: 1707311; 9 September 2021).

2.3. Instruments

Stage of change for weight control: To assess this variable, the Stage of Change Questionnaire (URICA—short form) [32] adapted to weight control and to Spanish was used [14]. This scale classifies the individual in a stage of change (precontemplation, contemplation, preparation, action, and maintenance) for weight control. The participants answered the following question, “Have you tried to lose/control your weight?”, marking the option that fit their behavior: (1) Yes, I have done it for more than 6 months; (2) Yes, I have done it for less than 6 months; (3) No, but I will try in the next 30 days; (4) No, but I will try in the next 6 months; (5) No, and I do not intend to try in the next 6 months.

Physical activity: To measure total physical activity (TPA) and moderate-to-vigorous physical activity (MVPA) the Spanish version of the global physical activity questionnaire [33] was used. This questionnaire assesses MVPA performed during leisure time

and TPA. MVPA for moderate-to-intense leisure-time physical activity was calculated as the product of the frequency (number of days per week) and duration (hours). MVPA represents the number of hours of practice (moderate-to-vigorous intensity) per week. TPA is obtained as the product of the frequency and duration in hours for active commuting and moderate-and-vigorous-intensity PA during a week.

Healthy and unhealthy eating behaviors: To assess this behavior the Spanish version [34] of the weight-related behaviors scale [35] was used. This scale assesses the weight loss behaviors of individuals, both healthy and unhealthy. It comprises 15 items on a Likert-type scale ranging from 1 to 5 (never to always), divided into healthy weight-control behaviors with 6 items (“consume more fruits and vegetables”) and unhealthy weight-control behaviors with 9 items (“consume very little food”).

Healthy eating and weight self-efficacy (HEWSE): The Spanish version of the HEWSE scale [36] was used. This scale contains 11 items that assess the individual’s beliefs that they can engage in behaviors related to healthy food consumption (e.g., “I have confidence that I can attain and maintain my ideal weight”) and weight maintenance (e.g., “If I gain weight, I am able to lose that weight in a timely manner”) obtained in a single factor. Individuals respond to HEWSE items using a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Motivation to control weight: To assess motivation to control weight, the behavioral regulation in exercise questionnaire (BREQ-3), adapted to weight control [37] and Spanish [34], was used. This questionnaire measures the different types of motivation regulations towards weight-control behavior. It consists of 23 items on a Likert-type scale ranging from 1 to 5 (not at all true to completely true). The questionnaire begins with the statement “I control my weight. . .”, and it is divided into six subscales measuring intrinsic, integrated, identified, introjected, and external regulation, and amotivation. Intrinsic, integrated, and identified regulation can be grouped into autonomous motivation, which is composed of 11 items (“because controlling my weight is a fundamental part of who I am”). Introjected and external regulation are grouped into controlled motivation, with 8 items (“because I feel guilty when I don’t do it”), and amotivation, with 4 items (“I don’t see the point in controlling my weight”), remains the same.

2.4. Statistical Analysis

In line with the first objective of the present study (to examine whether the stages of change for weight control, healthy and unhealthy behavior for weight control, total physical activity, and moderate-to-vigorous physical activity changed over the course of an academic year), frequency, descriptive, normality, paired-difference, and bivariate correlation analyses were performed. To address the second objective of this study (whether healthy eating and weight self-efficacy, together with the three types of motivation (autonomous, controlled motivation, and amotivation) assessed at the beginning of the academic year can predict total physical activity, moderate-to-vigorous physical activity, and healthy and unhealthy weight-control behaviors at the end of the academic year in a group of adolescents and young adults), a stepwise multiple regression analysis was conducted. Assumptions of the model including collinearity, independence, homoscedasticity, and normality were examined through linear regression analyses between study variables. The objective of his approach was to identify the most significant predictor variable, with study variables entered progressively using IBM SPSS v.30.

3. Results

3.1. Descriptive and Differences Analysis

This section reports the findings related to the study's first primary objective. Table 1 shows the means, standard deviations, skewness, and kurtosis of the study variables. Adolescents' responses indicate that total physical activity and moderate-to-vigorous physical activity were below the obtained mean value at both Time 1 and Time 2. Healthy weight-control behaviors were below the midpoint at Time 1 but above it at Time 2. Unhealthy weight-control behavior was below the midpoint at both time points. Autonomous motivation was above the scale midpoint, whereas controlled motivation and amotivation were below it. Most study variables followed normal distributions, with the exception of the kurtosis value for unhealthy weight-control behaviors.

Table 1. Descriptive statistics for all study variables.

Variables	Range	Mean	SD	Skewness	Kurtosis
Stages of change toward weight control Time 1	1–5	3.97	1.09	−1.20	0.95
Stages of change toward weight control Time 2	1–5	3.83	1.14	−1.16	0.72
Total physical activity Time 1	0–2460	440.27	491.43	1.25	1.36
Total physical activity Time 2	0–2460	464.74	492.77	1.20	0.91
Moderate-to-vigorous physical activity Time 1	0–1620	327.68	376.20	1.03	0.30
Moderate-to-vigorous physical activity Time 2	0–2160	350.89	406.03	1.27	1.35
Healthy weight-control behavior Time 1	1–5	2.44	0.55	0.43	0.18
Healthy weight-control behavior Time 2	1–5	3.31	0.80	0.04	−0.06
Unhealthy weight-control behavior Time 1	1–5	1.30	0.31	1.78	6.01
Unhealthy weight-control behavior Time 2	1–5	1.57	0.54	1.75	4.78
Healthy eating and weight self-efficacy Time 1	1–5	3.41	0.86	−0.13	−0.66
Autonomous motivation Time 1	1–5	3.37	0.92	−0.39	−0.32
Controlled motivation Time 1	1–5	2.40	0.99	0.42	−0.63
Amotivation Time 1	1–5	1.84	0.87	1.01	0.57

Note. SD = standard deviation.

As shown in Table 2, the paired-sample *t*-test indicates that both healthy and unhealthy weight-control behaviors increased significantly at Time 2, while total physical activity and moderate-to-vigorous physical activity remained unchanged. Furthermore, the paired-sample *t*-test revealed significant differences in overall stages of change between Time 1 and Time 2. The results of the Chi-square test revealed significant differences between the stages of change at Time 1 and Time 2 ($\chi^2 = 98.04$; $df = 16$; $p = 0.001$) and a small effect size ($V = 0.29$; $p = 0.001$). The corrected standardized residual values indicate significant differences in all stages of change at Time 1 and Time 2 (see Table 3). In addition, correlations between variables indicate a non-significant relationship between healthy weight-control behavior at Time 1 and unhealthy weight-control behavior at Time 1 ($r = 0.11$; $p = 0.07$) and Time 2 ($r = 0.07$; $p = 0.25$). As expected, healthy weight-control behavior at Time 1 is significant linked to healthy weight-control behavior at Time 2 ($r = 0.37$; $p = 0.01$). Finally, total physical activity at Time 1 shows a positive and significant relationship with moderate-to-vigorous physical activity at Time 1 ($r = 0.92$; $p = 0.01$), with total physical activity at Time 2 ($r = 0.54$; $p = 0.01$), and with moderate-to-vigorous physical activity at Time 2 ($r = 0.51$, $p = 0.01$).

Table 2. Descriptive statistics and analysis of differences between Time 1 and Time 2.

Variables	Mean Time 1	Mean Time 2	<i>t</i>	<i>p</i>	<i>d</i>
Stages of change toward weight control	3.97	3.83	1.96	0.03	1.21
Total physical activity	440.27	464.74	−0.87	0.19	474.80
Moderate-to-vigorous physical activity	327.68	350.89	−1.04	0.15	476.06
Healthy weight-control behavior	2.44	3.31	−19.04	0.01	0.78
Unhealthy weight-control behavior	1.30	1.57	−8.58	0.01	0.52

Note. *d* = Cohen's effect size.

Table 3. Frequency distribution of stages of change and Chi-square test for stages of change.

Stage of Change	Time 1	Time 2	Corrected Standardized Values
Precontemplation	5.2%	7.7%	4.8 *
Contemplation	5.9%	5.9%	3.2 *
Preparation	11.5%	10.8%	3.2 *
Action	41.6%	47.2%	4.3 *
Maintenance	35.7%	28.3%	6.1 *

Note. Corrected standardized residue values greater than ± 1.96 indicate significant differences *.

3.2. Regression Analysis

The results addressing the second objective of the study are presented in this section. Healthy eating and weight self-efficacy, and autonomous motivation emerged as the most important predictors of total physical activity. The inclusion of controlled motivation ($b = -0.02$; $t = 0.41$; $p = 0.68$) and amotivation ($b = -0.01$; $t = -0.15$; $p = 0.88$) in the model did not yield significant contributions. The model explained 13% of the variance in total physical activity (see Table 4). The models showed no signs of multicollinearity, with a tolerance value of 0.77, inflation variation factor of 1.30, and condition index from 7.99 to 9.77. The Durbin–Watson coefficient was 2.10, indicating independent residuals. Homoscedasticity and normality were confirmed through partial regression plots, histograms, and normal probability plots.

Table 4. Regression analysis for total physical activity at Time 2.

Predictors	<i>b</i>	<i>SE b</i>	β	<i>t</i>	R^2	<i>F</i>	95% CI LL-UL
Model 1					0.12	36.23 **	
Healthy eating and weight self-efficacy Time 1	191.14	31.76	0.34	6.02 **			128.63–253.65
Model 2					0.13	20.46 **	
Healthy eating and weight self-efficacy Time 1	155.62	35.94	0.27	4.33 **			84.88–226.37
Autonomous motivation Time 1	70.36	34.01	0.13	2.07 **			3.42–137.30

Note. *b* = unstandardized regression coefficient; *SE b* = standard error; β = standardized regression coefficient; R^2 = proportion of variance explained; CI = confidence interval; LL = lower limit; UL = upper limit; ** $p < 0.01$.

Similarly, healthy eating and weight self-efficacy and autonomous motivation were the most important predictors of moderate-to-vigorous physical activity. The inclusion of controlled motivation ($b = 0.03$; $t = 0.44$; $p = 0.66$) and amotivation ($b = -0.03$; $t = -0.44$; $p = 0.66$) did not contribute significantly to the model. Overall, the model explained 13% of the variance in moderate-to-vigorous physical activity (see Table 5). The models showed no signs of multicollinearity, with tolerance values ranging from 0.67 to 0.79, variance inflation factors between 1.27 and 1.50, and condition indices from 4.93 to 14.07. The Durbin–Watson coefficient was 2.11, indicating independent residuals. Homoscedasticity and normality were confirmed through partial regression plots, histograms, and normal probability plots.

Table 5. Regression analysis for moderate-to-vigorous physical activity at Time 2.

Predictors	<i>b</i>	<i>SE b</i>	β	<i>t</i>	<i>R</i> ²	<i>F</i>	95% CI LL-UL
Model 1					0.10	32.56 **	
Healthy eating and weight self-efficacy Time 1	150.18	26.32	0.32	5.71 **			98.38–201.99
Model 2					0.13	10.18 **	
Healthy eating and weight self-efficacy Time 1	114.38	30.33	0.25	3.78 **			54.68–174.08
Autonomous motivation Time 1	69.52	30.23	0.16	2.30 **			10.00–129.03

Note. *b* = unstandardized regression coefficient; *SE b* = standard error; β = standardized regression coefficient; *R*² = proportion of variance explained; CI = confidence interval; LL = lower limit; UL = upper limit; ** *p* < 0.01.

In the two models predicting healthy weight-control behavior at Time 2 (see Table 6), healthy eating and weight self-efficacy, as well as controlled motivation, both measured at Time 1, emerged as significant predictors, whereas autonomous motivation was not significant in any model (*b* = −0.07; *t* = −1.13; *p* = 0.26). Additionally, amotivation became a significant predictor in Model 2, with a negative regression coefficient. Model 2 accounted for 12% of the variance in healthy weight-control behavior. The models showed no signs of multicollinearity, with tolerance values ranging from 0.68 to 0.78, variance inflation factors between 1.28 and 1.48, and condition indices from 4.92 to 14.07. The Durbin–Watson coefficient was 2.07, indicating independent residuals. Homoscedasticity and normality were confirmed through partial regression plots, histograms, and normal probability plots.

Table 6. Regression analysis for healthy weight-control behavior at Time 2.

Predictors	<i>b</i>	<i>SE b</i>	β	<i>t</i>	<i>R</i> ²	<i>F</i>	95% CI LL-UL
Model 1					0.05	17.57 **	
Healthy eating and weight self-efficacy Time 1	0.22	0.05	0.24	4.19 **			0.12–0.32
Model 2					0.10	9.26 **	
Healthy eating and weight self-efficacy Time 1	0.24	0.05	0.27	4.11 **			0.13–0.36
Controlled motivation Time 1	0.21	0.05	0.27	4.16 **			0.11–0.32
Amotivation Time 1	−0.16	0.06	−0.17	−2.69 **			−0.27–−0.04

Note. *b* = unstandardized regression coefficient; *SE b* = standard error; β = standardized regression coefficient; *R*² = proportion of variance explained; CI = confidence interval; LL = lower limit; UL = upper limit; ** *p* < 0.01.

Finally, only controlled motivation at Time 1 significantly predicted unhealthy weight-control behavior at Time 2 (see Table 7). Neither healthy eating and weight self-efficacy (*b* = −0.04; *t* = 0.90; *p* = 0.37), autonomous motivation (*b* = −0.07; *t* = −1.66; *p* = 0.10), nor amotivation (*b* = −0.03; *t* = −0.75; *p* = 0.45) were significant predictor variables. The only resulting model (Table 7) accounted for 12% of the variance in unhealthy weight-control behavior. The model showed no signs of multicollinearity, with tolerance values ranging from 0.68 to 0.78, variance inflation factors between 1.28 and 1.48, and condition indices from 4.92 to 14.07. The Durbin–Watson coefficient was 1.87, indicating independent residuals. Homoscedasticity and normality were confirmed through partial regression plots, histograms, and normal probability plots.

Table 7. Regression analysis for unhealthy weight-control behavior at Time 2.

Predictors	<i>b</i>	<i>SE b</i>	β	<i>t</i>	<i>R</i> ²	<i>F</i>	95% CI LL-UL
Model 1					0.12	9.41 **	
Controlled motivation Time 1	0.20	0.04	0.38	5.83 **			0.13–0.27

Note. *b* = unstandardized regression coefficient; *SE b* = standard error; β = standardized regression coefficient; *R*² = proportion of variance explained; CI = confidence interval; LL = lower limit; UL = upper limit; ** *p* < 0.01.

4. Discussion

The initial findings of the descriptive results showed that there were changes in the stage of change towards weight control that were consistent with the first objective of the study. In the initial data collection conducted at the beginning of the academic year, the majority of participants were engaged in the action and maintenance stages. However, this percentage decreased in the second data collection conducted at the conclusion of the academic year among participants allocated to the maintenance stages. Conversely, there was an increase in the percentage of participants engaged in the action stage. Furthermore, the data obtained showed that a greater percentage of adolescents and young adults were in the precontemplation stage at the end of the academic year. However, during the contemplation stage, the percentage of contemplators remained consistent across both data collections within the academic year. These results are similar to those found by Chae et al. [2], in who's study most adolescents remained in the precontemplation and contemplation stages.

These changes are consistent with the transtheoretical model [6,7], which posits that the majority of individuals are not prepared for change and consequently exhibit a propensity to persist in their current behavior. Although most adolescents express an interest in weight [1,2], the observed changes may be minimal. In accordance with the conclusion drawn by Marentes-Castillo et al. [38], interest alone is not enough to bring about a change towards healthy behavior.

Furthermore, the observed changes in weight-related behaviors were limited to healthy and unhealthy weight-control behaviors, with no significant changes observed in physical activity. Healthy and unhealthy weight-control behaviors increased significantly at the end of the academic year, which leads us to explore, as mentioned by Chae et al. [2], whether adolescents have adequate knowledge of the weight-control strategies they could implement, although it has been shown that both healthy and unhealthy behaviors are used to control or lose weight [33,39]. The absence of changes in physical activity is consistent with current data, which show an increase in physical inactivity among Mexican adolescents aged 10 to 19 years between 2006 and 2021, highlighting the need to promote physical activity in the family and school context [40,41].

Based on the results obtained, hypothesis 1 (H_1)—which proposed that the stages of change for weight control, healthy and unhealthy weight-control behaviors, total physical activity, and moderate-to-vigorous physical activity would vary over the course of an academic year—is partially supported.

Along this line, promoting change implies the inclusion of psychological variables, and not only the traditional target behavior as physical activity and dietary changes [13,14]. Promoting change entails utilizing the processes of change that are characteristic of each stage of change, which in most cases are not included in intervention programs [8].

This reasoning leads to the second objective of the study (hypotheses H_2 and H_3), which was to examine whether healthy eating and weight self-efficacy and the three types of motivation (assessed at the beginning of the academic year) could predict physical activity and healthy and unhealthy weight-control behaviors at the end of the academic year using a longitudinal approach.

The results partially supported hypothesis H_2 and H_3 , indicating that healthy eating and weight self-efficacy and autonomous motivation are important predictors of physical activity, consistent with the previous research [17,18,30]. Additionally, healthy eating and weight self-efficacy and controlled motivation significantly predicted healthy weight-control behavior, with amotivation showing a negative association. Notably, autonomous motivation did not significantly predict healthy weight-control behavior. Finally, only controlled motivation significantly predicted unhealthy weight-control behavior.

These findings highlight the need to explore why autonomous motivation is related to physical activity but not to healthy weight-control behaviors. In this sense, Eisenberg et al. [29] mentioned that controlled motivation for healthy eating was associated with disordered eating behaviors. Although the literature generally identifies autonomous motivation as a key predictor of healthy behaviors [26,28,31], our findings suggest that, in the context of weight-control behaviors among adolescents, controlled motivation may play a more decisive role. Furthermore, both controlled motivation and amotivation have been linked to negative outcomes such as healthy behavior dropout and psychological ill-being [25]. These results reveal the paradoxical role of controlled motivation, which significantly predicted both healthy and unhealthy weight-control behaviors. This suggests that external pressures may drive behavior in both adaptive and maladaptive directions. Future research should explore the influence of cultural and school-related factors on how adolescents internalize motivation, as well as the intention–behavior gap, which may be shaped by psychological variables such as self-efficacy and motivation—central to understanding and promoting sustained healthy behaviors.

Overall, this study shows that, despite adolescents' and young adults' interest in their weight, only minimal changes can be observed over the course of an academic year. These limited changes are consistent with the theoretical framework of the transtheoretical model of change, which states that sustained behavior change requires individuals to make multiple attempts and ongoing effort to maintain the change [7].

Psychological variables need to be considered to gain a deeper understanding of behavior change and the adoption of healthy habits. To date, most studies aimed at promoting lifestyle changes have focused primarily on dietary changes and physical activity prescriptions, which alone are insufficient. Likewise, relying solely on the stages of change is not enough to promote meaningful change. Effective interventions should target key psychological variables, including self-efficacy, motivation, and the processes of change associated with the stages of change.

This study has several limitations. The stages of change were used only as a descriptive reference point due to their ordinal nature, which limits the ability to capture dynamic transitions in behavior. Consequently, the use of the transtheoretical model of change in this study does not allow for a detailed analysis of individual trajectories over time. It is recommended that future research consider undertaking analyses of intra-individual change, such as latent transition analysis or growth modeling, in order to facilitate a more comprehensive understanding of how adolescents progress or regress through the stages of change. This would provide a more nuanced perspective of behavioral development and facilitate the identification of patterns that are not visible in cross-sectional or purely descriptive approaches. Moreover, the non-experimental design and the one-year follow-up period limit our ability to determine the influence of external variables on changes in weight-related behaviors. It is therefore recommended that subsequent studies implement intervention programs incorporating healthy eating and weight self-efficacy, motivation, and processes of change. Ideally, such programs should include comparison groups so that the effectiveness of these interventions can be assessed more robustly.

5. Conclusions

The general conclusion of this study is that adolescents' potential interest in change is not sufficient to generate significant behavioral changes over time, which may also reflect that adolescents may engage in weight-related behaviors rather than structured weight-control behaviors. Understanding the stages of change and their associated processes of change, as well as the psychosocial variables that explain them during adolescence (particularly the role of autonomous and controlled motivation), is crucial for the develop-

ment of interventions that can be effectively designed and implemented in school settings, potentially with the involvement of families.

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