REVISTA BRASILEIRA DE MEDICINA DE FAMÍLIA E COMUNIDADE
RBMFC

www.rbmfc.org.br
ISSN 2197-7994

Research Article

Prevalence of physical activity in adolescents of Montes Claros, Minas Gerais, Brazil

Prevalência da prática de atividade física em adolescentes de Montes Claros, Minas Gerais, Brasil

Prevalencia de práctica de actividad física en adolescentes de Montes Claros, Minas Gerais, Brasil

Andre Rodrigues de Senna Batista Filho[1], Luíza Moura Menezes[1], Marina de Pádua Pires[1], Vitória Cunha Silva[1], Amanda Rezende Martuscelli[1], Lucinéia de Pinho

[1]Centro Universitário FIPMoc – Montes Claros (MG), Brazil.

Abstract

Introduction: Adolescence represents a crucial period in the formation of habits that will last into adulthood. The practice of constant physical activity results in good academic development, psychic homeostasis, and maintenance of ideal body weight. **Objective:** To analyze the prevalence of physical activity among adolescents in the city of Montes Claros, Minas Gerais (MG). **Methods:** This is a quantitative, cross-sectional and analytical study, carried out in 13 educational institutions in Montes Claros (MG) in 2017, using the Regular Physical Activity Questionnaire (PAQ-C) to evaluate the practice of physical activity, related to the variables: gender, age group, and school grade. Descriptive and bivariate analyses were performed with a significance level of 5%. **Results:** 897 students were interviewed, with an average age of 12.64 (±0.98) years. Of those interviewed, 48.0% were considered moderately active, followed by 29.9% sedentary and 22.0% active. There was a higher prevalence of active people in the first two years of elementary school II, male and younger people ($p<0.001$). The average number of hours watching TV for the entire group was 7.45 (±6.47) hours per day. In the surveyed sample, students who were aged between 13 and 14 years ($p<0.05$) spent more hours watching TV per day and had lower average PAQ-C scores. The number of hours watching TV was not influenced by the physical activity level in any of the variables. **Conclusions:** There is a high prevalence of male adolescents classified as active, as well as students aged between 11 and 12 years and in the first two years of elementary school II. However, the population analyzed presents a worrying sedentary behavior, considering the number of hours spent by these individuals watching TV per day.

Keywords: Exercise; Adolescent; Sociodemographic factors.

Corresponding author:
Andre Rodrigues de Senna Batista Filho
E-mail: andresenna1@live.com
Funding:
No external funding.
Ethical approval:
CAAE: 63391416.9.0000.5146
Provenance:
Not commissioned.
Peer review:
External.
Received: 11/28/2022.
Approved: 09/07/2023.

How to cite: Batista Filho ARS, Menezes LM, Pires MP, Silva VC, Martuscelli AR, Pinho L. Prevalence of physical activity in adolescents of Montes Claros, Minas Gerais, Brazil. Rev Bras Med Fam Comunidade. 2023;18(45):3596. https://doi.org/10.5712/rbmfc18(45)3596

Resumo

Introdução: A adolescência representa um período crítico na formação de hábitos que perdurarão na idade adulta. A prática de atividade física constante resulta em um bom desenvolvimento escolar, homeostase psíquica e manutenção do peso corporal ideal. **Objetivo:** Analisar a prevalência da prática de atividade física de adolescentes no município de Montes Claros (MG). **Métodos:** Trata-se de um estudo quantitativo, transversal e analítico, realizado em 13 instituições de ensino de Montes Claros (MG) no ano de 2017, utilizando o Questionário sobre Atividade Física Regular (PAQ-C) para avaliar a prática de atividade física, relacionada às variáveis: sexo, faixa etária e série escolar. Participaram alunos de 11 a 14 anos, devidamente matriculados nas últimas quatro séries do ensino fundamental. Realizaram-se análises descritivas e bivariadas com nível de significância de 5%. **Resultados:** Foram entrevistados 897 alunos, com média de idade de 12,64 (±0,98) anos. Dos entrevistados, 48,0% foram considerados moderadamente ativos, seguidos de 29,9% de sedentários e 22,0% de ativos. Observou-se maior prevalência de ativos nos dois primeiros anos do ensino fundamental II, do sexo masculino e mais jovens (p<0,001). A média de horas assistindo à TV de todo o grupo foi de 7,45 (±6,47) horas por dia. Na amostra pesquisada, alunos que estavam com idade entre 13 e 14 anos (p<0,05) passaram mais horas assistindo à TV por dia e tiveram menores escores médios do PAQ-C. A quantidade de horas assistindo TV não foi influenciada pelo nível de atividade física em nenhuma das variáveis. **Conclusões:** Há alta prevalência de adolescentes do sexo masculino classificados como ativos, assim como alunos com idade entre 11 e 12 anos e nos dois primeiros anos do ensino fundamental II. Contudo, a população analisada apresenta um comportamento sedentário preocupante, tendo em vista a quantidade de horas gastas por esses indivíduos assistindo à TV.

Palavras-chave: Exercício físico; Adolescente; Fatores sociodemográficos.

Resumen

Introducción: La adolescencia representa un período crucial en la formación de hábitos que perdurarán hasta la edad adulta. La práctica de actividad física constante redunda en un buen desarrollo académico, homeostasis psíquica y mantenimiento del peso corporal ideal. **Objetivo:** Analizar la prevalencia de actividad física entre los adolescentes de la ciudad de Montes Claros, Minas Gerais (MG). **Métodos:** Se trata de un estudio cuantitativo, transversal y analítico, realizado en 13 instituciones educativas de Montes Claros (MG) en 2017, utilizando el Cuestionario de Actividad Física Regular (PAQ-C) para evaluar la práctica de actividad física, relacionada con las variables: género, grupo de edad y grado escolar. Participaron estudiantes de 11 a 14 años, debidamente matriculados en los últimos 4 grados de la escuela primaria. Se realizaron análisis descriptivos y bivariados con un nivel de significación del 5%. **Resultados:** fueron entrevistados 897 estudiantes, con una edad promedio de 12,64 (±0,98) años. El 48,0% de los encuestados se consideró moderadamente activo, seguido por el 29,9% sedentario y el 22,0% activo. Hubo mayor prevalencia de activos en los dos primeros años de la enseñanza básica II, varones y de menor edad (p<0,001). El promedio de horas frente a la televisión para todo el grupo fue de 7,45 (±6,47) horas al día. En la muestra encuestada, los estudiantes que tenían entre 13 y 14 años (p<0,05) dedicaban más horas al día a ver la televisión y menor puntuación media en el PAQ-C. El número de horas frente a la televisión no estuvo influenciado por el nivel de actividad física en ninguna de las variables. **Conclusiones:** Existe una alta prevalencia de adolescentes varones clasificados como activos, así como estudiantes con edades entre 11 y 12 años y en los dos primeros años de la enseñanza básica II. Sin embargo, la población analizada presenta un comportamiento sedentario preocupante, considerando la cantidad de horas que estos individuos dedican a ver televisión.

Palabras clave: Ejercicio físico; Adolescente; Factores sociodemográficos.

INTRODUCTION

Adolescence is the transition period between childhood and adulthood. During these years, various organic changes occur, ranging from brain and body changes to the development of behavior that will last throughout the following years, which makes this growth phase a time of high biopsychosocial vulnerability.[1,2]

For an individual to reach adulthood with their full genetically determined growth potential, it is necessary that both they and their environment collaborate harmoniously for healthy development. Physical activity is one of the several variables that are important for this, which provides advantages for the promotion of health and the prevention and treatment of diseases, and if started in adolescence, it tends to continue in adulthood.[2]

The practice of physical activity in adolescence, in addition to reducing the percentage of body fat and promoting ideal weight, improves the health parameters and quality of life of individuals, positively influencing musculoskeletal development, the cardiovascular system, the control of chronic conditions

and mental health.[2,3] Physically active adolescents have lower levels of anxiety and depressive symptoms when compared to inactive ones, which makes physical activity an important promoter of mental well-being.[2,3]

Exercise is associated with a reduction in morbidity and mortality from non-communicable diseases and is recommended for the protection and promotion of health in contemporary populations. Knowledge of patterns in the practice of physical activity among young people is important, since lifestyle habits from this period are consolidated in future stages of life. The prevalence of physical inactivity in this population is quite high and, therefore, is still a challenge for public health in the country. The description of the practice of physical activity in different population strata over time is necessary for monitoring this behavior[4] and can contribute to proposing health measures even during adolescence, minimizing the future impacts of physical inactivity.

The objective of this study was to analyze the prevalence of physical activity among adolescents in the municipality of Montes Claros (MG).

METHODS

Population and sample

This was an epidemiological, cross-sectional, analytical and quantitative study. The population of this study was made up of students enrolled in elementary schools in the urban area of Montes Claros. The sample size was defined as follows: 95% confidence interval (95%CI), estimated prevalence of 30% and sampling error of 5%, considering a population of adolescents of approximately 20 thousand in the study age group. For design purposes, the number defined by the calculation was multiplied by a correction factor equal to two, considering that this is a cluster sampling (deff=2), and, to compensate for possible losses, an increase of 15% was established. . Thus, the minimum number of students defined for the study was 867 individuals.

The sample was selected by probabilistic cluster sampling. Both schools and classes were drawn by simple random sampling. All students in the selected classes were invited to participate in the research. The inclusion criteria were as follows: students aged between 11 and 14 years old and regularly enrolled in the school and class selected. Adolescents without duly authorized consent forms and who did not complete the questionnaires were excluded.

Instruments and procedures

Initially, contact was made with the municipality's education and health managers, and each person was given a copy of the project and the opinion of the Research Ethics Committee. After approval of the research by the secretariats, contact was made with the school directors, when clarifications were made about the importance, objectives and methodology of the project, and authorization was requested to schedule data collection and consent. of students' parents.

Before data collection, a pilot study was carried out in a school with the same characteristics as the study schools to standardize research procedures. The team responsible for the research was trained and supervised.

The data used here were collected in the second half of 2017, in 13 municipal schools, by a multidisciplinary team made up of professionals from the areas of physical education, nutrition, speech therapy, medicine, nursing and also undergraduate students linked to scientific initiation.

To collect data, a questionnaire was used that included sociodemographic characteristics: sex, age, shift in which the student studies and school year, with the variable "age" grouped into: 11 and 12 years old; 13 and 14 years;[4] and the variable "grade" in: the first two years of elementary school II (sixth and seventh grades) and the last two years of elementary school II (eighth and ninth grades).

The Regular Physical Activity Questionnaire (PAQ-C) is a questionnaire created to be administered to individuals eight to 18 years old, which presents questions that address different aspects of the practice of physical activity in the last seven days, the answers to which are coded in a manner increasing from 1 to 5 points. The first question addresses the weekly frequency of physical activity in free time, covering 22 different types of exercises and the possibility of adding one more activity not included in the questionnaire. The subsequent six questions concern the practice of physical activity with moderate to vigorous intensity during physical education classes at different times of the day (morning, afternoon and evening) on the seven days of the week. The following two questions were aimed at analyzing the level of physical activity in the last seven days and its specific frequency of performance on each day of the week. In addition, there was a question about the number of hours watching TV per day (hours/day), but these data were not included in the score calculation.[5,6]

Thus, each question had a score from 1 to 5 and the final score was calculated by averaging the questions, resulting in classifications of: very sedentary (1), sedentary (2), moderately active (3), active (4) and very active (5). In this way, it was possible to group individuals as active or sedentary, with active being those with a score ≥3 and sedentary individuals with a score <3.[7,8]

Statistics procedure

Data were extracted from the questionnaires and transferred to a database built in the Statistical Package for the Social Sciences (SPSS), version 21.0. Accordingly, it was possible to carry out descriptive and bivariate analyses, applying the Student *t*-test and the Mann-Whitney test for independent samples, when the comparison was made between the means of the sexes, age group, shift and grade. To compare proportions, the $\chi 2$ test was used. In all analyses, a significance level of 5% was used ($p \leq 0.05$).

Ethical care

The study was conducted in accordance with Resolution 466/12 of the National Health Council,[9] and was approved by the Research Ethics Committee of the State University of Montes Claros (UNIMONTES), under Protocol No. 1.908.982. Authorization for conducting research in educational institutions was by the Institutional Agreement, signed by the Municipal Secretary of Education of Montes Claros (MG).

Students were initially informed about the objective of the study, its methodology, benefits, risks and the procedures that would be carried out to collect data. Furthermore, the anonymity and confidentiality of the information provided and its exclusive use for scientific purposes were guaranteed. Afterwards, the adolescent's legal representative signed the TCLE Informed Consent Form, and the minor, the TALE Informed Consent Form, for accepting to participate in the study.

RESULTS

A total of 897 students participated in this study, with a predominance of females (52.6%), students from the morning shift (92.2%), those in the first two years of elementary school II (62.7%) and those 13 and 14 years old (52.6%), and with a mean age of 12.64 (±0.98) years. Table 1 presents the physical activity levels of adolescents; 48.0% of those surveyed were considered moderately active, followed by sedentary (29.9%) and active (22.0%).

In the analysis of the association between the practice of physical activity and sociodemographic characteristics, a significant difference (p<0.001) was observed for sex. There was a higher prevalence of active students among males (82.4%) compared to females (58.9%). In the age group analysis, 76.7% of adolescents 11 and 12 years old were classified as active, compared to 64.0% aged 13 and 14 years old (p<0.001). Regarding the difference between the grades, 74.9% of active students were in the first two years of elementary school II, compared to 61.8% in the last two years of elementary school II, with a significant difference being found between them (p<0.001) (Table 2).

When evaluating the daily time that students spent in front of the television, it was observed that the average was 7.45 (±6.47) hours/day. In the analysis of the average hours dedicated to TV, between individuals in the two groups of physical activity level separated by sex, age group, shift and grade, there was no significant difference between those considered active and those sedentary (p>0.05) (Table 3).

Table 1. Prevalence of physical activity levels in school adolescents. Montes Claros (MG), Brazil.

PAQ-C result	n	%
Very sedentary	1	0.1
Sedentary	268	29.9
Moderately active	431	48.0
Active	197	22.0
Very active	0	0.0
Total	897	100.0

PAQ-C: Regular Physical Activity Questionnaire.

Table 2. Analysis of association between physical activity level and the variables sex, age group, shift and grade among school adolescents. Montes Claros (MG), Brazil.

		Physical activity level			p-value
		Sedentary	Active	Total	
		n (%)	n (%)	n (%)	
Sex	Female	194 (41.1)	278 (58.9)	472 (100)	<0.001*
	Male	75 (17.6)	350 (82.4)	425 (100)	
Age	11 and 12 years	99 (23.3)	326 (76.7)	425 (100)	<0.001*
	13 and 14 years	170 (36.0)	302 (64.0)	472 (100)	
Shift	Morning	252 (30.5)	575 (69.5)	827 (100)	0.278
	Afternoon	17 (24.3)	53 (75.7)	70 (100)	
Grade	First two years of elementary school II (sixth and seventh grade)	141 (25.1)	421 (74.9)	562 (100)	<0.001*
	Last two years of elementary school II (eighth and nineth grade)	128 (38.2)	207 (61.8)	335 (100)	

PAQ-C: Regular Physical Activity Questionnaire; PHL: physical activity level; *significant difference — χ^2 test (p<0.05).

Table 4 shows the mean scores obtained from the analysis of physical activity level (PAL) and hours watching TV, categorizing the results by sex, age group, shift and grade. With regard to the average PAQ-C results, there was a significant difference between the variables age and grade, with the age group of 11 and 12 years old and the first two years of elementary school II being those with the highest means. Looking at the average number of hours watching TV, there was a significant difference between ages, with individuals 13 and 14 having a higher mean.

In the analysis of the most practiced activities among schoolchildren, the highest percentage was running or jogging (58.0%), followed by soccer (57.9%), walking (57.4%) and cycling (55.6%), and swimming (13.2%) represented the activity with the lowest number (14) of those with doing physical activity. Between sexes, the activity most performed by boys was soccer (77.8%), followed by cycling (65.9%) and running

Table 3. Mean and standard deviation of hours watching TV by physical activity level, sex, age group, shift and grade.

		Hours watching TV		
		PAL Sedentary	**PAL Active**	**p-value***
Sex	Female	8.23	7.48	0.958
	Male	6.67	7.15	0.653
Age	11 and 12 years	6.91	6.48	0.754
	13 and 14 years	8.31	8.18	0.550
Shift	Morning	8.03	7.42	0.732
	Tarde	4.29	5.94	0.868**
Grade	First two years of elementary school II (sixth and seventh grade)	6.85	6.82	0.650
	Last two years of elementary school II (eighth and nineth grade)	8.84	8.25	0.736

PAL: physical activity level; *significant difference — Student *t*-test (p<0.05); **significant difference — Mann-Whitney test (p<0.05).

Table 4. Mean and standard deviation of physical activity level and hours watching TV by the variables sex, age group, shift and grade.

		PAQ-C result	**Hours watching TV**
Sex	Female	2.70	7.79
	Male	3.15	7.06
	P	0.342	0.287
Age	11 and 12 years	3.03	6.58
	13 and 14 years	2.81	8.22
	P	0.014*	0.005*
Shift	Morning	2.91	7.60
	Afternoon	3.01	5.54
	P	0.377	0.077
Grade	First two years of elementary school II (sixth and seventh grade)	3.01	6.83
	Last two years of elementary school II (eighth and nineth grade)	2.77	8.47
	P	0.031*	0.593

*Significant difference — Student *t*-test for independent samples (p<0.05).

or jogging (65.2%). When we analyzed the girls, we observed that 63.9% did dancing, 59.5% walking and 55.0% playing dodgeball.

DISCUSSION

Regarding participants in general, Brazilian studies with representative samples that used the same measuring instrument showed higher results than those found in this study, ranging from 68 to 93.5%.[6,7-111]

Moreover, we observed that individuals in the 6th and 7th grade achieved higher levels in the PAQ-C compared to individuals in the 8th and 9th grade, showing a significant difference between them. This result is consistent with other studies in the area, which revealed a decrease in PAL with getting older.[6,7,12]

Analyzing the international[13,14] and national[10,11,15,16] literature, studies have shown a lower proportion of active women. A study carried out with schoolchildren in the city of Rio Verde (GO), which used the same measuring instrument, found a percentage of 70.26% of active females compared to 86.03% of males, in addition to lower levels of scores of PAQ-C physical activity.[17] Another study carried out on students from public and private schools in the city of João Pessoa (PB) resulted in 78.6% of females doing 10 minutes or more of physical activity per week, compared to 89 .6% of males, with a higher percentage of sports and physical exercises also in the second group.[18] Results similar to this were also obtained in other studies that used a different measuring instrument.[19-22]

This difference is mainly cultural, given the existence of sexual stereotypes according to which girls are more encouraged to explore the universe of intellectual and artistic activities, while boys focus more on the universe of body culture of movement.[17] Furthermore, the behavioral, psychological and even sexual maturity differences present in the age group studied may be factors that contribute to this difference; however, this hypothesis requires further investigation to be proven.[23]

Studies using another measuring instrument to assess the level of sedentary lifestyle in ten-year-old individuals found no relationship between PAL and school shift.[24,25] These data converge with those found in the present study, which did not show a significant difference. between individuals in the morning shift in relation to those in the afternoon. However, no studies were found that used the PAQ-C as a measurement tool and correlated PAL and shift, which makes it difficult to compare results.

Regarding hours watching TV, the average found in the present study was 7.45 (±6.47) hours/day, a worrisome result, since other studies analyzed reported an average of 3.6 hours/day[11] and 5.61 hours/day.[7] These values do not include other sedentary behaviors common among young people using portable media technologies, for example the use of smartphones, notebooks and tablets. Currently, addiction to these media technologies among adolescents is prevalent and is harmfully related to health aspects.[26] Although the present study identified a higher average number of hours watching TV, other studies corroborated the non-association of PAL with the number of hours dedicated to TV, in addition to having an average number of hours per day greater than 2, recommended by specialized societies, taking into account the age group analyzed.[7,11,16] With this result, adolescents who watch television more than two hours per day have double the chance of developing excess weight compared to those who watch two or fewer hours a day. With each additional hour of daily television, the baseline body mass index (BMI) increased by a mean of 0.9% in the adolescents analyzed.[27-31]

Regarding hours watching TV and age, other studies that used the PAQ-C as a measurement tool demonstrated that older students have a higher average number of hours watching TV compared to younger students.[11,32] This characteristic is similar to that found in the present study, in which the mean

number of hours in front of the TV showed a significant difference between the groups. One factor that must be considered in such a population is the influence of "new media" (such as tablets, phones, social media) on their sedentary behavior, a variable not researched in the present study, since screen time, in general, has even greater contribution to various risk factors and different health problems.[33]

When investigating students' grade, there was a significant difference between the average PAQ-C physical activity scores in the present study, in which students in the first two years of elementary school II had an average of 3.01 hours and students in the last two years of elementary school II showed an average of 2.77 hours, which demonstrated that in students in more advanced grades there was a decrease in PAL with growing older[32]

No information was found that correlated the hours spent watching TV with school hours; However, we found in the present study that students in the morning shift spent more hours (7.60 hours) in front of the TV compared to those in the afternoon shift (5.54 hours). Even so, it is known that time spent watching TV contributes around 81% to the occurrence of a sedentary lifestyle, reducing the performance of activities that require caloric expenditure above the individual's basal metabolic rate.[11]

Furthermore, this habit is associated with the consumption of foods with high energy value, which increases the population's obesity levels.[34] In other studies, the median spent on this practice was 3 hours a day, and, for each additional hour, there was a 2% increase in the obesity level of individuals. As for sex, the daily average of hours watching TV was 3.6, with 3.7 for girls and 3.5 for boys.[11] In the present study, the higher prevalence of girls watching TV was also observed, with 7.54 hours a day for girls and 7.13 hours for boys.

In reference to the type of physical activity practiced, soccer appeared to be the predominant activity among male adolescents in several published studies that administered the same research instrument, in agreement with the analysis carried out in the present study, showing that boys were the most individuals considered physically active. Other most frequent activities in this group include moderate jogging and cycling, results compatible with those found in the present study. [6,11,35] In relation to females, the most prevalent activities in agreement among studies include dancing, followed by walking and cycling. [6,11,35] However, the present study showed that the third most performed activity by the females analyzed was dodgeball.

With the exception of dancing, the predominant activities in both groups are among the four most practiced among the students analyzed. Studies covering the Brazilian population in general also show that soccer is the most practiced sport, with a strong cultural influence.[36,37] One of the studies classifies swimming as the fifth most practiced sport at the national level, a fact that contrasts with the result found in the present analysis, in which swimming was the activity with the fewest participants.[36]

The present study has certain limitations due to the fact that it was carried out only in municipal public schools in a specific region for data acquisition, and the results cannot be generalized to adolescents from private schools or other regions who do not attend schools. Furthermore, as this was a cross-sectional study, it is impossible to analyze causality between the variables, in addition to the fact that only hours watched on TV are considered as screen time, disregarding new media in this calculation.

The present study presents contributions for health and education professionals, as the results obtained can direct educational measures to be instituted in schools, to promote actions that encourage the practice of physical activity, especially in groups that are more likely to develop sedentary and very sedentary habits, according to sex, age group, shift and grade. Furthermore, such results can be used as a comparative parameter for future investigations in other regions. Adolescents identified with greater exposure to TV viewing represent potential groups for interventions that aim to reduce screen-based

sedentary entertainment, whether at home, at school or at work. The development of programs that encourage active leisure, physical activity and reducing the time that adolescents spend in front of the TV can be promising strategies for young people's health.

CONCLUSION

It can be concluded that, in relation to NAF, the population analyzed has a greater number of assets than was found in estimates found in other Brazilian cities. Added to this, males and those in the first two years of elementary school II were considered the group with the highest prevalence of active individuals, which is consistent with the literature analyzed. Despite the non-correlation of PAL with shift, more studies are needed to analyze this variable using the PAQ-C as a measuring instrument, given the current impossibility of comparing the present data with other realities. Despite this, the risk behavior of schoolchildren in Montes Claros (MG) can be considered greater than that of other Brazilian cities, considering the number of hours spent by these individuals watching TV.

CONFLICT OF INTERESTS

Nothing to declare.

AUTHORS' CONTRIBUTIONS

ARSBF: Conceptualization, Data Curation, Research, Methodology, Project Administration, Software, Writing – original draft, Writing – review & editing. LMM: Conceptualization, Investigation, Visualization, Writing – original draft, Writing – review & editing. MMP: Conceptualization, Investigation, Visualization, Writing – original draft. ARM: Conceptualization, Investigation, Visualization, Writing – original draft. VCS: Conceptualization, Investigation, Visualization, Writing – original draft. LP: Conceptualization, Data curation, Methodology, Supervision, Investigation, Visualization, Writing – original draft, Writing – review & editing.

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