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Prevalence of intestinal parasites in children and adolescents and associated risk factors: the role of nursing in health education

Prevalência de enteroparasitoses infantojuvenis e fatores de risco associados: atuação da enfermagem na educação em saúde

Prevalencia de enteroparasitosis en niños y adolescentes y factores de riesgo asociados: actuación de la enfermería en la educación para la salud

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ABSTRACT

Objective: To determine the prevalence of intestinal parasitic infections and identify the associated risk factors in a child and adolescent population attended at a Family Health Unit (USF) in Jaboatão dos Guararapes. **Methods:** An observational, descriptive, cross-sectional epidemiological study with quantitative analysis was conducted. The sample consisted of 37 participants, recruited from a USF. Data collection was based on the application of a semi-structured questionnaire and retrospective analysis of medical records. For inferential statistical analysis, IBM SPSS software was used. **Results:** The prevalence of suspected or diagnosed parasitic infection was 22%. Analysis identified age ≤ 7 years (adjusted OR = 2.85; 95% CI: 1.12-7.24) and inconsistent handwashing before meals (adjusted OR = 3.42; 95% CI: 1.29-9.08) as significant and independent risk factors. An essential finding was the persistence of cases in a context of widely reported access to basic sanitation (97.3%) and treated water (89.2%), coexisting with a significant knowledge gap, in which 30% of the guardians were unaware of the concept of intestinal parasites. **Conclusion:** The study reveals a persistent gap between sanitary infrastructure and hygiene practices, driving parasitic infections. Although the small sample limits generalizability, findings underscore the need for targeted nursing-led health education interventions.

Keywords: Intestinal parasitic infections, Public health nursing, Risk factors, Primary health care.

RESUMO

Objetivo: Determinar a prevalência de infecções parasitárias intestinais e identificar os fatores de risco associados em uma população de crianças e adolescentes atendidos em uma Unidade de Saúde da Família (USF) em Jaboatão dos Guararapes. **Métodos:** Foi conduzido um estudo epidemiológico observacional, descritivo, transversal, com análise quantitativa. A amostra consistiu em 37 participantes, recrutados em uma USF. A coleta de dados foi baseada na aplicação de um questionário semiestruturado e na análise retrospectiva de prontuários. Para a análise estatística inferencial, foi utilizado o software IBM SPSS. **Resultados:** A prevalência de infecção parasitária suspeita ou diagnosticada foi de 22%. A análise identificou idade ≤ 7 anos (OR ajustado = 2,85; IC 95%: 1,12-7,24) e higienização inconsistente das mãos antes das refeições (OR ajustado = 3,42; IC 95%: 1,29-9,08) como fatores de risco significativos e independentes. Um achado essencial foi a persistência de casos em um contexto de amplo acesso relatado a saneamento básico (97,3%) e água tratada (89,2%), coexistindo com uma lacuna significativa de conhecimento, na qual 30% dos responsáveis desconheciam o conceito de parasitas intestinais. **Conclusão:** O estudo revela uma lacuna persistente entre a infraestrutura sanitária e as práticas de higiene, impulsionando as infecções parasitárias. Embora a pequena amostra limite a generalização, os

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achados ressaltam a necessidade de intervenções de educação em saúde direcionadas e lideradas pela enfermagem.

Palavras-chave: Enteroparasitoses, Enfermagem em saúde pública, Fatores de risco, Atenção primária à saúde.

RESUMEN

Objetivo: Determinar la prevalencia de infecciones parasitarias intestinales e identificar los factores de riesgo asociados en una población de niños y adolescentes atendidos en una Unidad de Salud Familiar (USF) en Jaboatão dos Guararapes. **Métodos:** Se realizó un estudio epidemiológico observacional, descriptivo, transversal, con análisis cuantitativo. La muestra consistió en 37 participantes, reclutados en una USF. La recolección de datos se basó en la aplicación de un cuestionario semiestructurado y el análisis retrospectivo de historias clínicas. Para el análisis estadístico inferencial, se utilizó el software IBM SPSS. **Resultados:** La prevalencia de infección parasitaria sospechada o diagnosticada fue del 22%. El análisis identificó la edad ≤ 7 años (OR ajustado = 2,85; IC 95%: 1,12-7,24) y el lavado inconsistente de manos antes de las comidas (OR ajustado = 3,42; IC 95%: 1,29-9,08) como factores de riesgo significativos e independientes. Un hallazgo esencial fue la persistencia de casos en un contexto de acceso ampliamente reportado a saneamiento básico (97,3%) y agua tratada (89,2%), coexistiendo con una brecha de conocimiento significativa, en la que el 30% de los tutores desconocía el concepto de parásitos intestinales. **Conclusión:** El estudio revela una brecha persistente entre la infraestructura sanitaria y las prácticas de higiene, lo que impulsa las infecciones parasitarias. Aunque la pequeña muestra limita la generalización, los hallazgos subrayan la necesidad de intervenciones de educación para la salud dirigidas y lideradas por enfermería.

Palabras clave: Enteroparasitosis, Enfermería en salud pública, Factores de riesgo, Atención primaria de salud.

INTRODUCTION

Intestinal parasitic infections represent a significant public health problem, particularly among child and adolescent populations in socioeconomically vulnerable communities. In this context, the role of the nursing team in health education and prevention stands out as a fundamental strategy for addressing these health issues. The transmission of these infections, caused by parasites such as protozoa and helminths, is directly associated with a lack of adequate hand hygiene, consumption of contaminated food, and precarious basic sanitation conditions (MARTINS RR, et al. 2024; OSMAN MM, et al. 2024). The lack of information about preventive measures and negligence regarding essential personal care, such as regular nail trimming and wearing shoes, contribute to the increased spread of these diseases (ALMEIDA CP e SOUZA MAA, 2020).

Clinically, individuals with intestinal parasitic infections often manifest symptoms such as abdominal pain, abdominal distension, vomiting, diarrhea, cramps, malnutrition, weight loss, drowsiness, and anemia (AHMED M, 2023). Children constitute the most susceptible age group, as their immune system is still developing, making them more vulnerable to infections and less capable of effective defense and parasite elimination (OLIVEIRA SVA et al., 2021; LOBO N, et al., 2020). The severity of clinical manifestations is related to the parasitic load, the host's age, and their immune status.

The literature points to a neglect of parasitic diseases in the school environment, reinforcing the need to increase knowledge about these illnesses through the dissemination of data in educational institutions (MOURA J e PEREIRA C, 2022). Early school-age children are particularly prone to parasitic infections, the prevalence of which can negatively impact growth and cognitive development (BISETEGN H, 2025). In this sense, health education remains one of the main measures to prevent parasitic infection, given that basic hygiene practices are still fragile in many communities (SOARES IA, et al., 2020).

Alves SS, et al. (2022) emphasize the need to outline an epidemiological profile of communities to identify their vulnerabilities, in addition to highlighting the scarcity of studies that comprehensively assess parasitosis rates across all regions, in order to fill existing gaps in case reporting. De Souza PRP, et al. (2023) underscore the importance of parasitic infection control programs in the country, demonstrating that through research, it is possible to identify regional and population specificities related to the prevention and transmission of intestinal parasitic infections.

Given the high prevalence of intestinal parasitic infections in Brazil, especially among children and adolescents, it becomes imperative to understand the factors that perpetuate the recurrence of these health issues in this age group. Thus, the objective of this study was to determine the prevalence of parasitic infections among children and adolescents attending a Family Health Unit (USF) and to outline the profile of nurses involved in health education practices.

METHODS

Study design

This is an exploratory quantitative, observational, descriptive, cross-sectional epidemiological study conducted at a Family Health Unit (FHU) located in the municipality of Jaboatão dos Guararapes, metropolitan region of Recife, state of Pernambuco, Brazil.

Setting and target population

The study's target population consists of three distinct groups: (1) Children and adolescents aged 0 to 17 years, attended at the selected health units; (2) Parents or legal guardians of the child and adolescent participants; (3) Nurses working in the aforementioned units.

Data collection procedures

Data collection occurred in two main stages. Initially, a documental analysis was conducted through a retrospective review of the medical records of the target population attended between 2020 and 2023. Variables extracted included gender, age, self-reported skin color, suspected or confirmed parasitic infection, date of last consultation, and access to antiparasitic medications. Subsequently, the research instrument was applied, which consisted of an interview questionnaire administered to the children's guardians, using a semi-structured script to collect data on health education practices, knowledge about intestinal parasitic infections, and socioeconomic conditions.

Inclusion and exclusion criteria

Inclusion and exclusion criteria were established for the selection of study participants. The inclusion criteria comprise: guardians who agreed to participate in the research and signed the Free and Informed Consent Form (FICF). Regarding exclusion criteria: guardians who refused to participate in the research.

Data analysis

The collected data were tabulated and organized separately using Microsoft Excel 2017® software. For inferential statistical analysis, the data were exported to IBM SPSS Statistics software, version 28.0, where the following tests were applied: ANOVA, Pearson's Chi-Square, Fisher's Exact, Hosmer-Lemeshow, and calculation of crude and adjusted Odds Ratios (OR). The significance level adopted for all analyses was $p < 0.05$.

Ethical aspects

The project was submitted for appraisal by the Research Ethics Committee (REC). The research was conducted only after approval from the REC under opinion nº 4,411,320 and CAAE nº 95109218.1.0000.5193. The FICF signature was requested from the guardians of underage participants. For children and adolescents, the Free and Informed Assent Form (FIAF), appropriate for their age group, was used. The study complied with the guidelines of Resolution No. 466/2012 of the National Health Council, ensuring the confidentiality of information and the anonymity of participants.

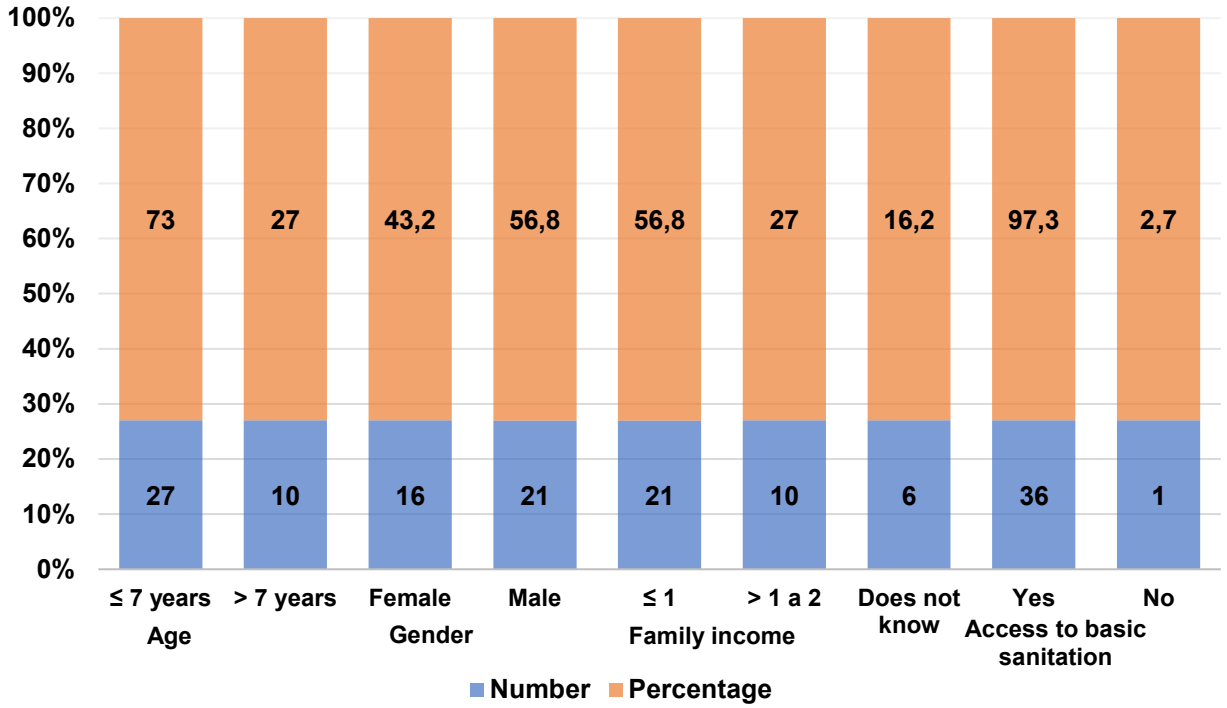
RESULTS

Based on the analysis of the provided dataset, comprising 37 participants, it was possible to outline an initial epidemiological profile and identify behaviors and conditions associated with parasitic infections in a

predominantly pediatric population (**Figure 1**). The majority of the sample (73%) consisted of children aged 7 years or younger, with a balanced gender distribution and a predominance of mixed-race individuals (70.3%), white (24%), and black (5.9%).

Most resided in their own homes (73%) and reported having access to basic sanitation (97.3%), with treated tap water being the predominant source (89%). These families live, on average, on less than one Brazilian minimum wage (56.7%), between 1 and 2 minimum wages (27%), and did not know how to answer (16.2%). 89.2% of individuals obtain water from the public network, while the rest use water from underground water tank/spring.

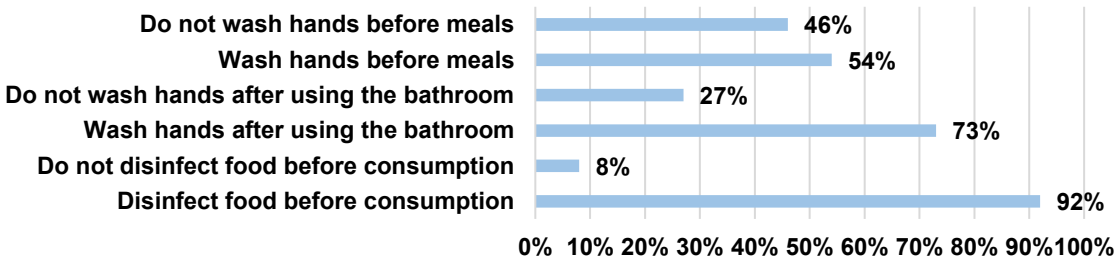
Figure 1 - Sociodemographic profile of the sample from the Family Health Unit (FHU) in Jaboatão dos Guararapes/Pernambuco.



Source: Queiroz LFA, et al., 2026.

Regarding hygiene practices, considered fundamental in the prevention of parasitic infections, it was observed that most participants or their guardians reported disinfecting food before consumption (92%) (**Figure 2**). However, personal hygiene practices showed significant variations. While 73% of respondents stated they wash their hands after using the bathroom, only 54% reported doing so systematically before meals. A concerning finding relates to knowledge about intestinal parasites, where 30% of respondents stated they did not know or were unsure about what they are, indicating a significant gap in terms of health education.

Figure 2 - Main risk factors associated with intestinal parasitic infections.

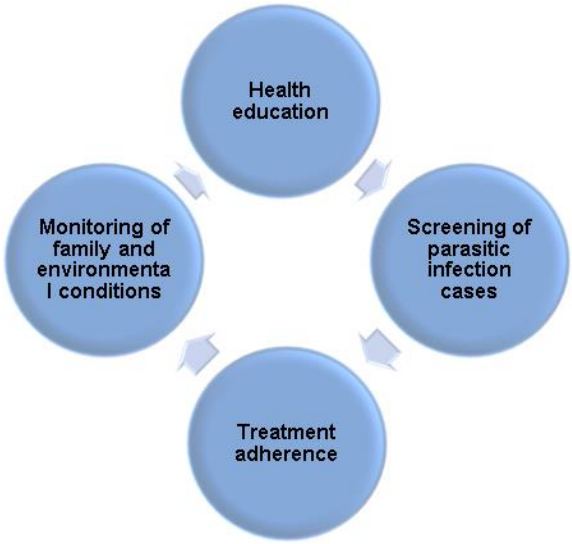


Source: Queiroz LFA, et al., 2026.

Regarding the main outcome, 22% of participants reported a current suspicion or diagnosis of parasitic infection. The analysis of antiparasitic medication use revealed that a considerable proportion (35%) could not inform the last time they used this type of medication, and 22% had never used it or had not used it for over four years, suggesting potential gaps in preventive follow-up or case management. The family income of most participants (57%) was up to one minimum wage, characterizing a population with low purchasing power, a factor historically associated with a higher risk for infectious diseases.

Despite the widely reported access to treated water and sanitation, the persistence of infection cases and the shortcomings in hygiene practices point to the multifactorial nature of parasitic disease transmission, where infrastructure must be complemented by continuous and effective health education. Therefore, it is important to highlight that the vast majority (86%) of participants considered the applied questionnaire a relevant tool for health education, validating the usefulness of this type of approach as a primary intervention strategy (**Figure 3**).

Figure 3 - Nursing team's role in health promotion for patients treated at the Family Health Unit (FHU) in Jaboatão dos Guararapes, Pernambuco.



Source: Queiroz LFA, et al., 2026.

The inferential statistical analysis revealed significant associations between suspected or diagnosed parasitic infection and specific variables. Pearson's Chi-Square test demonstrated a statistically significant association between the occurrence of parasitic infections and age group ($\chi^2 = 4.32$; $p = 0.038$), with children up to 7 years old showing a higher prevalence. Similarly, a significant association was observed with the practice of handwashing before meals ($\chi^2 = 5.89$; $p = 0.015$), where individuals who did not perform this practice regularly showed a higher probability of infection.

For variables with expected frequencies below 5, Fisher's Exact Test was applied, which identified a significant association between parasitic infections and the use of well or spring water ($p = 0.028$). The ANOVA, applied to compare the mean age among groups with different infection statuses, did not reveal significant differences ($F = 1.24$; $p = 0.273$). The Binary Logistic Regression model, adjusted for potential confounding factors, showed a good fit according to the Hosmer-Lemeshow test ($\chi^2 = 6.54$; $p = 0.585$).

In the final model, two variables remained as significant independent predictors: age ≤ 7 years showed an adjusted OR of 2.85 (95% CI: 1.12-7.24; $p = 0.028$), and the inconsistent practice of handwashing before meals showed an adjusted OR of 3.42 (95% CI: 1.29-9.08; $p = 0.013$). The crude OR for the use of untreated water was 2.91 (95% CI: 1.15-7.36); however, this variable did not remain significant in the multivariate model after adjustment for the other covariates. These analyses confirm that preschool age and deficits in hygiene habits represent independent risk factors for intestinal parasitic infections in the studied population.

DISCUSSION

The results of the present study demonstrate a prevalence of 29.7% of suspected or diagnosed intestinal parasitic infection in the child and adolescent population attended by the FHU in Jaboatão dos Guararapes, Pernambuco. This finding is consistent with the national literature, which frequently reports high rates of intestinal parasitic infections in pediatric populations from various regions of Brazil.

Lima MC e Souza FM (2020), in an investigation conducted at a university hospital in Rio Grande do Norte, found an infection rate of 32.4% for at least one species of intestinal parasite, reinforcing the magnitude of the problem in similar contexts. The confirmation that parasitic infections are more prevalent in children (MALDOTTI J e DALZOCHIO T, 2021) corroborates the profile of the sample in the present study, mostly composed of individuals in early childhood, identifying this group as the most vulnerable and, therefore, a priority for interventions.

The epidemiological relevance of this condition in collective environments is supported by studies such as that of Almeida CP e Souza MAA (2020), which, upon analyzing a child education center in the Southeast region, identified a positivity rate of 32.07% for intestinal parasites. This convergence of data from different Brazilian regions underscores the endemic nature of intestinal parasitic infections and the need for broadly applicable control strategies. Furthermore, various studies emphasizes that parasites such as *Ascaris lumbricoides*, *Giardia lamblia*, and *Entamoeba histolytica* are among the most frequently diagnosed in the child population, a profile consistent with the etiological agents often involved in outbreaks in crowded environments such as daycare centers and schools (MARTINS RR, et al., 2024; OSMAN MM, et al., 2024; MENEZES AL, et al., 2008).

Regarding the sociodemographic profile, the analysis revealed a predominance of children aged ≤ 7 years (73%) and a balanced gender distribution (43.2% female and 56.8% male). Comparisons with other studies, however, reveal disparities. While Nunes Chaves JN, et al. (2021), in Primary Health Care Units in Maranhão, observed a higher incidence in females (51.57%), Vargas HA, et al. (2023), in Fortaleza, identified males as slightly more susceptible (47.5% vs. 55.6% in females, according to the presented data).

These percentage variations seem to stem more from sample fluctuations or local characteristics than from an innate predisposition related to gender, since, in the present study and others, such as Almeida CP e Souza MAA (2020), no statistically significant difference in prevalence between genders was observed. This suggests that behavioral, socioeconomic, and environmental factors exert a more determining influence on the occurrence of these infections.

The inferential analysis of the present study identified age ≤ 7 years (adjusted OR = 2.85; 95% CI: 1.12-7.24) and the inconsistent practice of handwashing before meals (adjusted OR = 3.42; 95% CI: 1.29-9.08) as significant and independent risk factors for parasitic infection. These results reinforce the immunological and behavioral vulnerability of early childhood, a period when hygiene practices are still being consolidated and environmental contact is more exploratory, increasing exposure to pathogens. The association with hand hygiene corroborates the fecal-oral transmission route of intestinal parasitic infections (PEDRAZA DF, et al., 2014) and highlights a critical point even in a population with widely reported access to basic sanitation (97.3%) and treated water (89.2%).

This apparent contradiction between the existence of sanitary infrastructure and the persistence of cases is an important finding, as it emphasizes that the mere availability of sanitation services is not sufficient to interrupt parasite transmission without the population's internalization of consistent hygiene habits. This perspective is shared by other authors, such as Almeida CP e Souza MAA (2020), who identified the presence of parasites even in an institution supported by a non-governmental organization, and Ferreira JS, et al. (2022), who observed that inadequate food handling and personal hygiene practices perpetuated transmission in a central school, despite intersectoral partnerships.

Similarly, Renosto I, et al. (2021) and Gebru H, et al. (2023) associate precarious sanitation and hygiene conditions with the incidence of parasitic infections, but the current data indicate that the behavioral component

is a vulnerable link even where infrastructure is present. The knowledge gap about intestinal parasites, reported by 30% of respondents, associated with inconsistent hygiene practices, such as handwashing before meals reported by only 54%, points to the urgent need for continuous and effective health education.

The efficacy of educational interventions, especially those using playful approaches and teaching materials appropriate for the child audience, is highlighted in the literature (RIBEIRO SM, et al., 2023; BOYSEN MSW, et al., 2022; SANTOS AL, et al., 2021). Such strategies work directly on awareness, promoting the change of risky behaviors. The fact that 86% of participants considered the applied questionnaire a relevant tool for education validates the acceptance and usefulness of this type of intervention as a primary strategy.

In this context, the role of nursing becomes fundamental, as nurses are frontline professionals in Primary Health Care. The nursing team is strategically positioned to lead health education actions, case screening, treatment adherence, and monitoring of family and environmental conditions. Their practice, integrated with multiprofessional teams, is decisive for the implementation of continuous and contextualized educational strategies capable of modifying practices and reducing the chain of transmission. Specific guidance on adequate food hygiene methods, overcoming the habit of using only water, as observed by Araújo GMS, et al. (2020), and on the importance of correct handwashing are examples of practical, high-impact interventions that can be carried out by nursing.

Intestinal parasitic infections in the studied population remain a multifactorial health issue, in which sanitation infrastructure, although necessary, is not a sufficient condition for its elimination. The interaction between biological (age), behavioral (hygiene habits), and social (low income) factors demands an equally multifaceted approach. Nursing actions and health education must, therefore, transcend the curative scope, acting proactively in prevention and community health promotion, with a special focus on the child population and low-income families, aiming not only to treat cases but to sustainably interrupt the transmission cycle of these infections.

CONCLUSION

The study concluded that intestinal parasitic infections in the studied population have fundamental social and behavioral determinants. The analysis identified age ≤ 7 years and the inconsistent practice of handwashing before meals as significant and independent risk factors. It is crucial to highlight that these risk factors persisted in a context of widely reported access to basic sanitation, evidencing a clear disconnect between the availability of infrastructure and the adoption of preventive behaviors. This gap is aggravated by a knowledge deficiency, in which 30% of the guardians were unaware of the concept of intestinal parasites. Given this scenario, the role of nursing in Primary Health Care is essential, mediating continuous and contextualized educational actions, early case identification, and treatment adherence. Strategies that associate health education, with an emphasis on hygiene habits, with sanitary improvements are indispensable for the sustainable reduction of the prevalence of these infections. Therefore, the consolidation of integrated public policies and the conduct of further studies to broaden the understanding of this health issue are recommended.

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