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Abstract

Background: Adolescent motherhood can cause lifelong health inequalities for mothers and children.

Aims: To compare the frequency of negative birth outcomes and stunting among children aged ≤ 5 years born to adolescent and non-adolescent mothers.

Methods: This was a secondary analysis of the Demographic and Health Survey data of 2755 adolescent and non-adolescent mothers aged 15–49 years who had a negative birth outcome and their children aged 0–5 years in Türkiye. The data were analysed using SPSS version 25.0.

Results: Term low birthweight and stunting were significantly higher among children of adolescent mothers. Multivariable analysis revealed that lack of education, poverty, and living in eastern Türkiye increased the risk of delivering a term low birthweight infant. The risk of being stunted was 2.22 times higher among women with lower socioeconomic status, and 2.86 times higher among low birthweight infants.

Conclusion: Our results show that macroenvironmental factors have a marked impact on maternal and child health, especially among women with lower socioeconomic status. Improving

maternal education, income, and other socioeconomic inequalities can help improve maternal and child health in Türkiye.

Keywords: adolescent pregnancy, low birthweight, stunting, social inequalities, Türkiye

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Introduction

Adolescent pregnancy can result in lifetime health disparities for mothers and their children. Compared with nonadolescent mothers, adolescent mothers are more likely to have lower educational level, less financial independence, worse mental health, and less social support (1–4). All these factors may contribute to the high prevalence of malnutrition among adolescent mothers (5). Globally, 13% of all births are by women aged 15–19 years in emerging countries (6). In Türkiye, the adolescent pregnancy rate was 10.2% in 1993 but it decreased to 4% by 2018 (7). Although the rate of adolescent pregnancy has decreased over the years, it is still important when the resultant health and social problems are considered.

The most important indicator of chronic malnutrition among children is stunting (8). In the last 20 years, although there has been a decrease globally in stunting among children aged

Although there are data on the socioeconomic vulnerabilities and health risks of adolescent mothers in Türkiye, it is unclear what effect adolescent motherhood has on negative birth outcomes and stunting. We used the national data from the 2018 Türkiye Demographic and Health Survey to: (1) compare the frequency of negative birth outcomes (low birthweight, preterm birth, and term low birthweight) and stunting in children aged

Methods

Study design, participants and measurements

This study used secondary data analysis of the 2018 Türkiye Demographic and Health Survey that focused on adolescent and nonadolescent mothers aged 15–49 years and their children aged 0–5 years. The survey was a nationally representative cross-section that Hacettepe University Institute of Population Studies has been conducting every 5 years since 1993 to monitor population health and maternal and child health indicators. The purpose of the survey was to gather data at the household level to formulate national indicators related to demographics, fertility, child mortality, maternal health, and nutritional status of women and children. The survey data are used by public institutions, especially the Ministry of Health, for the planning of health services (17).

For the main data of the 2018 Türkiye Demographic and Health Survey, a weighted, multistage, stratified cluster sampling approach was used. Two questionnaires for households and individuals were used to collect data through face-to-face interview. Out of 9056 women aged 15–49 years in these households, 7346 (81.1%) were interviewed. The sampling design details and the results of the main data of the study were reported in the 2018 Turkey Demographic and Health Survey Analysis and Report (7).

We used the individual questionnaire dataset to analyse 2755 women aged 15–49 years who had a live birth up to 5 years before the questionnaire was administered. There were no available data for the birthweight and date of birth of 117 children, or for the height of 653 children. Identification of the secondary dataset and the inclusion and exclusion criteria for the study are shown in Figure 1 .

The dependent variables were, having a child in the past 5 years with negative birth outcomes (low birthweight, preterm birth, and term low birthweight) and stunting. Stunting was defined using the 2006 WHO growth standard reference point based on z score ≤ 2 standard deviations (18). Negative birth outcomes were: (1) low birthweight,

Maternal age was the main independent variable and was categorized as adolescent (15–19 years) and nonadolescent (20–29, 30–39, and 40–49 years). Maternal educational level was defined as no education, primary, secondary, and high school, and while evaluating the variable, the secondary and high school categories were combined. Welfare status was categorized as richest, richer, middle, poorer, and poorest according to wealth index, and evaluated by combining them into 3 groups as rich (richest and richer), middle, and poor (poorer and poorest). The country data were divided into 5 regions of west, south, central, north, and east. The residential area was considered as urban or rural. The gender of the child was categorized as male or female. For the stunting dependent variable, children’s age was

evaluated monthly and categorized into 3 groups (0–11, 12–23, and 24–59 months). Antenatal visits were categorized as yes (mother attended ≥ 4 visits) or no (mother did not attend ≥ 4 visits or did not know the answer). The variables used in this study were categorized according to the Demographic and Health Surveys guidelines (19).

Ethical considerations

The 2018 Türkiye Demographic and Health Survey was evaluated and approved by Hacettepe University Ethics Commission. The researchers obtained permission on 2 December 2021 from Hacettepe University Institute of Population Studies to use the data.

Data analysis

SPSS version 25.0 (SPSS, Chicago, IL, USA) was used for statistical analysis. Descriptive findings were divided into groups according to adolescent or nonadolescent motherhood and recorded as number and percentage distribution. The relationship between adolescent motherhood and negative birth outcomes and stunting was evaluated with the $\chi 2$ test. Logistic regression analysis was used to estimate term low birthweight and stunting differences according to independent variables. As anticipated, logistic regression analysis was not conducted separately for each maternal age (adolescent and adult mothers) because of the small sample size, particularly in the adolescent group. A pooled analysis was performed instead for each outcome variable, with maternal age as the main exposure. Regression coefficients were calculated with 95% confidence intervals (CIs) to calculate the odds ratios (ORs). The independent effect of every variable was observed in the first stage (crude) and then checked for all variables in the equation (adjusted OR; AOR). P

Results

In the study group of 2755 mothers, 189 (6.8%) were adolescents. Table 1 shows the sociodemographic characteristics of adolescent and nonadolescent mothers. Eighty-two (43.4%) adolescent mothers had secondary or higher education compared with 1309 (51.0%) nonadolescent mothers. One hundred and twenty-five (66.1%) adolescent mothers and 1233 (48.1%) nonadolescent mothers were poorer or poorest. Sixty-six (34.9%) adolescent and 768 (29.9%) nonadolescent mothers lived in rural areas. One hundred and six (56.0%) adolescent and 218 (28.1%) nonadolescent mothers had not received adequate antenatal care. There were significant differences between adolescent and nonadolescent mothers in terms of educational level, welfare status, and antenatal care during pregnancy (P

Table 2 compares the rates of negative birth outcomes and the indicators of chronic malnutrition according to maternal age (adolescent/nonadolescent category). There were 2638 negative birth outcomes: 338 (12.8%) low birthweight, 405 (15.4%) preterm birth, and 205 (7.8%) term low birthweight. One hundred and sixteen (5.5%) children were stunted. The rate of low birthweight was 14.8% among adolescent mothers and 12.7% among nonadolescent mothers. Preterm birth rate was similar for the 2 groups. The rate of delivering a term low

birthweight infant was 11.8% among adolescent mothers and 7.5% among nonadolescent mothers, and this difference was significant (P

Table 3 shows the factors associated with term low birthweight in a sample of 2638 women who gave birth in the past 5 years. Adolescent motherhood was evaluated as the main independent variable. Term low birthweight, which was significantly different in the children of adolescent and nonadolescent mothers, lost significance in the adjusted analysis (AOR 1.50, 95% CI: 0.90–2.49). Multivariate analysis showed that lack of maternal education (AOR 1.75, 95% CI: 1.22–2.50), poverty (AOR 2.09, 95% CI: 1.44–3.02), and living in eastern Turkey (AOR 1.39, 95% CI: 1.01–1.92) increased the risk of term low birthweight.

Multivariate analysis of the factors associated with stunting in 2102 women who gave birth in the last 5 years is shown in Table 4 . Adolescent motherhood was evaluated as the main independent variable. There was a significant difference in child stunting between adolescent and nonadolescent mothers but after adjustment, there was no significant difference (AOR 0.77, 95% CI: 0.36–1.64). The risk of being stunted was 2.22 times higher (95% CI: 1.47–3.50) in the poorest/poorer group than the other socioeconomic status. Children born with low birthweight were 2.86 times more likely to be stunted than children born with normal birthweight (95% CI: 1.90–4.30). The risk of stunting increased 1.69 times (95% CI: 1.12–2.53) in children aged 12–23 months compared with 0–11 months, and 1.65 times (95% CI: 1.20–2.65) in children aged 24–59 months.

Discussion

We evaluated the sociodemographic characteristics of adolescent and nonadolescent mothers, negative birth outcomes, and frequency of stunting of their children in Türkiye using data from the 2018 Türkiye Demographic and Health Survey. We also investigated the risk factors associated with term low birthweight and stunting. We found that adolescent mothers had lower educational level, were poorer, and did not receive adequate antenatal care compared with nonadolescent mothers. Although term low birthweight and stunting were risk factors among children of adolescent compared with nonadolescent mothers, they were no longer significant when adjusted for socioeconomic variables. This indicates that if socioeconomic status of adolescent mothers were improved, their risk of negative birth outcomes and stunting would be reduced. Our results could be explained by women with good socioeconomic status not becoming pregnant during adolescence. However, some studies have reported that young maternal age is not the sole reason for negative birth outcomes, other factors such as emotional response, coping skills, and social resources may be involved (20, 21). If adolescent pregnancies are well planned and there is adequate prenatal care, they will cease to be high risk (22).

Low maternal educational level was a risk factor for term low birthweight in multivariate analysis,

which is consistent with previous studies (23,24). Term low birthweight was higher in the poorest households and in eastern Türkiye, which is less developed than western Türkiye. The significant association between low socioeconomic status and low birthweight that was shown in this study was also found in other studies (25,26). Low socioeconomic and educational status lead to low health consciousness and low nutritional status, which can increase the risk of low birthweight. There is considerable variation in the prevalence of low birthweight across regions and within countries; however, most occurs in low- and middle-income countries and especially among the most vulnerable populations in these countries.

Multivariate analysis showed that being poorer was a risk factor for stunting. Similarly, in the National Family Health Survey of India, stunting was more common among those living in poorer rural areas (27). These findings are similar to a study conducted in the United Republic of Tanzania and indicated that children in lower socioeconomic groups had a greater risk of stunting than those in higher socioeconomic groups (28). Several other studies have found that household socioeconomic status is a prominent predictor of child stunting (29,30). The availability of high-quality foods and affordability of nutrient-rich foods affects a family's ability to provide a healthy diet and prevent child stunting. Higher household income enables more to be spent on food and child care (12). This is in line with the suggestion that households with larger income, as a proxy for household wealth, have more money to spend on child nutrition, which lowers the prevalence of stunting (31).

Our large sample data from the 2018 Türkiye Demographic and Health Survey indicated that economic status was the main risk factor for negative birth outcomes and stunting. Special attention must be paid to individuals who have low educational levels, low income, and live in eastern Türkiye. To improve child health, we suggest that it is more important to improve education and reduce inter-regional poverty rather than trying to reduce adolescent pregnancies. These results support the idea that macroenvironmental factors have a marked impact on maternal and child health.

In our multivariate analysis, being older than 2 years was a risk factor for stunting. Children's age in months had a nonlinear, upward-sloping effect on the probability of stunting. Therefore, children tend to be more stunted as they age, although this effect diminishes over time (31). Stunting was more common among children older than 18 months in the National Family Health Survey of India, and children aged

Our study had some limitations. Firstly, there were some missing data, such as age at which the children ceased breastfeeding, accompanied by many confounding factors, maternal body mass index, and maternal birth weight. Secondly, the main data in the 2108 Türkiye Demographic and Health Survey were collected 4 years ago. Finally, the lack of anthropological data for all children led to a reduction in the sample size. Regardless of the limitations, it was possible to

identify the risk factors for stunting and term low birthweight in the eastern and western provinces of Türkiye after multivariate linear regression analysis or adjustment for all missing confounders.

Conclusion

This study adds to the limited research examining the association between adolescent pregnancy and adverse birth outcomes and stunting in Türkiye. Our results suggest that it would be more beneficial to make changes at the macroenvironmental level to reduce low birthweight and stunting. The social role of women living in eastern Türkiye is perhaps the cause of these health inequalities. Strengthening the position of women in society will prevent adolescent pregnancies and contribute to the prevention of other health inequalities. Our results emphasize the necessity of planning maternal and child health services by considering the educational level of women, income inequalities, and even regional inequalities, while defining the risk factors related to adolescent pregnancy.

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Issues défavorables de la grossesse et retard de croissance chez les mères adolescentes et non adolescentes en Türkiye

Résumé

Contexte : La maternité chez les adolescentes peut être à l'origine d'inégalités en matière de santé tout au long de la vie pour les mères et les enfants.

Objectif : Comparer la fréquence des issues défavorables de la grossesse et du retard de croissance chez les enfants âgés de cinq ans ou moins nés de mères adolescentes et non adolescentes.

Méthodes : Il s'agissait d'une analyse secondaire des données de l'enquête démographique et sanitaire menée auprès de 2755 mères adolescentes et non adolescentes âgées de 15 à 49 ans ayant connu une issue défavorable de la grossesse et de leurs enfants âgés de zéro à cinq ans en Türkiye. Les données ont été analysées à l'aide du logiciel SPSS, version 25.0.

Résultats : Les taux d'insuffisance pondérale à la naissance et de retard de croissance dans les cas de grossesses à terme étaient nettement plus élevés chez les enfants nés de mères adolescentes. L'analyse multivariée a révélé qu'un faible niveau d'éducation, la pauvreté et les conditions de vie dans l'est de la Türkiye augmentaient le risque d'accoucher à terme d'un enfant présentant une insuffisance pondérale à la naissance. Le risque de retard de croissance était 2,22 fois plus élevé chez les enfants nés de femmes ayant un faible statut socio-économique et 2,86 fois plus élevé chez les nourrissons présentant une insuffisance pondérale à la naissance.

Conclusion : Nos résultats montrent que les facteurs macro-environnementaux ont un impact significatif sur la santé maternelle et infantile, en particulier chez les femmes qui ont un faible statut socio-économique. Améliorer l'éducation maternelle, le revenu et remédier à d'autres inégalités socio-économiques peuvent contribuer à améliorer la santé maternelle et infantile en Türkiye.

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ملخص
الخلفية: تعاني الأمهات المراهقات من نتائج سلبية أكثر للولادة مقارنة بالأمهات غير المراهقات.
الأهداف: تقييم ما إذا كانت الأمهات المراهقات في تنزانيا أكثر عرضة لنتائج سلبية للولادة وتقزم الأطفال مقارنة بالأمهات غير المراهقات.
طريقة البحث: تم استخدام بيانات من المسح الديموغرافي والصحي في تنزانيا لعام 2015-2016. تم استخدام تحليل الانحدار اللوجستي لتقدير الاختلافات في النتائج السلبية للولادة والتقزم بين الأمهات المراهقات وغير المراهقات.
النتائج الرئيسية: كان لدى الأمهات المراهقات احتمالية أعلى بنسبة 2.22 مرة للإصابة بنتائج سلبية للولادة مقارنة بالأمهات غير المراهقات. كان لدى الأمهات المراهقات احتمالية أعلى بنسبة 86.2 مرة للإصابة بالتقزم مقارنة بالأمهات غير المراهقات.
الاستنتاجات: تعاني الأمهات المراهقات من نتائج سلبية للولادة وتقزم الأطفال أكثر من الأمهات غير المراهقات. يجب على صانعي السياسات والممارسين تعزيز الوعي بين المراهقات حول المخاطر المرتبطة بالحمل المبكر.

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