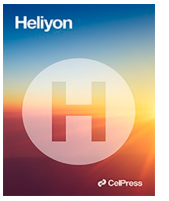
Heliyon 9 (2023) e20738

Contents lists available at ScienceDirect

Heliyon

journal homepage: www.cell.com/heliyon



Review article

Social determinants of health of racial and ethnic minority adolescents: An integrative literature review

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ARTICLE INFO

Keywords:
Social determinants
Ethnic and racial minorities
Adolescents
Review
Health status
Nursing

ABSTRACT

Integration of adolescents with diverse cultural backgrounds into the country of residence is associated with some form of rejection and discrimination, predisposing them to undesirable health outcomes. In this regard, the aim of this study was to identify the social determinants of the health of racial and ethnic minority adolescents. In this integrative literature review, PubMed, EMBASE, Cochrane Library, and CINAHL databases were searched from 2016 to 2021 and studies were selected according to the PRISMA 2020 guidelines. Health status was limited to health outcomes according to the definition proposed by the World Health Organization and Healthy People 2020. The social determinants of health were classified according to the research framework of the National Institute on Minority Health and Health Disparities. Six types of health status were identified: self-rated health, obesity and overweight, global self-worth, emotional well-being, anthropometric measurement, and psychosocial adjustment. The social determinants of health were at the individual and interpersonal level, and the domains included the biological (gender, illness experience), psychological (acculturative stress), and sociocultural environment (e.g., socioeconomic status, parents' educational level, household death due to violence). Therefore, future research must prioritize their sociocultural environments to reduce the negative impact of discrimination and sociocultural and structural differences on racial and ethnic minority adolescents.

1. Introduction

The period of adolescence is characterized by various emotional, psychological, and physical changes because of the associated transition from childhood to adulthood [1,2]. This makes adolescents susceptible to external factors including peer pressure and environmental changes [1]. The ability of an adolescent to overcome these life challenges determines and influences their adulthood [2]. Adolescent growth is influenced by the country, the environment in which they were born, and their access to health care, schools, and education [3]. Especially between the ages of 13–18, a teenager's emotions, social changes, the way they interact with others, and

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https://doi.org/10.1016/j.heliyon.2023.e20738
Received 28 December 2022; Received in revised form 3 October 2023; Accepted 5 October 2023
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the way their bodies develop change [4]. The influence of these social determinants may be worse for adolescents from socially isolated or racial and ethnic minority (REM) groups [3,5,6].

Race is socially defined as a portion of a population that has a common physical characteristic, ancestry, or language and ethnicity can be defined as a social classification based on the identity of a particular culture or ethnic group [7]. A REM group will be conceptualized as a non-dominant group (based on race and ethnicity) who lives in a particular geographical area or country aside from the native or the majority of the inhabited population [8]. Moreover, collective terms such as "race and ethnicity" are recommended instead of "race/ethnicity" [9]. Within many Asian countries, there has been a rise in international marriages and multiculturalism [10]. Adolescents in such families may be regarded as having a bicultural or multicultural background and differ from the majority of adolescents in terms of race and ethnicity and culture. The integration of adolescents with diverse cultural backgrounds into the society and country of residence has been noted to be associated with some form of rejection and discrimination, predisposing them to undesirable health outcomes [5,6,11,12]. The challenges that influence adolescents' health are further worsened by social inequality that affects their access to healthcare services and prudent health information [13,14]. These social and health determinants of REM adolescents have been of concern in France [11], Canada [5], South Korea [12], and the United States [6]. In the case of multicultural families, the challenge has been related to integration and avoiding segregation. The adolescent is therefore left with emotional aloofness and depression compared to adolescents from monocultural majority race groups [12]. The discrepancies associated with the unequal distribution of health damaging experiences is not because of a natural phenomenon but a combination of poor social policies and programs, an unfair economic arrangement, and natural or man-made disasters or migration [3]. The social gradient and health inequities within countries are caused by an unequal distribution of power, income, goods, and services, with unfairness to immediate access, visible discrimination, and poor education and health care amenities [3]. To mitigate the health disparities caused by racial and ethnic differences, the National Institutes of Health in the United States presented the National Institute on Minority Health and Health Disparities (NIMHD) research framework [15]. This framework encourages research that addresses the complex and multifaceted determinants of minority health and health disparities.

The social determinants of health (SDOH) are described as situations or conditions where people are born, grow, live, work, and age with factors relating to inequities in power and economic resources that are likely to create disparities in health outcomes between groups [3]. The challenges that have an influence on REM adolescents may be structural, societal, and/or cultural. For example, certain structural factors that promote racial discrimination contribute to an inequity gap in adolescent health [1,3]. In addition, the link between the undesirable effects of racial discrimination on the mental and physical health of REM adolescents are worsened due to adolescence being a particularly sensitive period of development [16]. However, adolescents' racial identity has been shown to mitigate or modulate the relationship between racial discrimination and the determinants of health outcomes [17,18]. To mitigate the influence and impact of discrimination, adolescents may employ emotion-focused coping behaviors (e.g., substance abuse, unhealthy/poor eating habits) to alleviate the overall stress [16,19,20]. Some of these momentary resolutions may result in significant unpleasant health consequences in later years [19,20].

Given the particular circumstances that can negatively affect the health of REM adolescents, researchers in recent decades have focused on the SDOH associated with this developmental stage. Systematic studies have attempted to describe the determinants of health associated with adolescence. These studies have examined the association of SDOH with physical activity [21,22], gender and substance abuse [23], and being overweight or obese [24], and certain diseases [25]. However, the particular issues related to REM adolescents have not been integrated into a single document for policy direction. In addition, studies that have identified SDOH for general health such as self-rated health or well-being of minority adolescents, and investigated them based on a systematic framework have been limited. Thus, the purpose of this integrated review is to identify and analyze the SDOH that are associated with the general health status of REM adolescents.

2. Methods

2.1. Design

An integrative review allows for a wide-ranging synthesis of the literature on a topic [26,27]. While integrative reviews can contribute to the accumulation of scientific evidence, it is important to follow a structured process to minimize bias and ensure results are accurate [28]. The researchers conducted a literature review following the five-step procedure suggested by Whittemore and Knafl [26]: problem identification, literature search, data evaluation, data analysis, and data presentation. Morever, we used the PRISMA guidelines for literature search, which is the second step conducting an integrated review [29].

2.2. Problem identification

The subject of this study emanated from concerns about the health disparities between culturally diverse minority adolescents and monocultural majority adolescents in South Korea [30]. Accordingly, this study attempted to identify the health status and SDOH in REM adolescents abroad and to compare them with domestic studies later. The specific research questions were as follows: "How is the health status of REM adolescents described in the literature applying the term ofsocial determinants of health?" and "What are the SDOH of REM adolescents?".

2.3. Literature search

The scope of "health status" was not status from a specific disease and was defined as the health status of a person or population evaluated in relation to morbidity, impairment, anthropological measures, mortality, functional status, and quality of life indicators as described by the World Health Organization [31] and general health status defined by the Office of Disease Prevention and Health Promotion [13]; life expectancy (with international comparison); healthy life expectancy; years of potential life lost (with international comparison); physically and mentally unhealthy days; self-assessed health status; limitation of activity; and chronic disease prevalence. The anthropometry measurements included height, weight, head circumference, body mass index (BMI), body circumference to assess for adiposity, and skin fold thickness [32].

In the context of this review, the terms " race and ethnicity populations" or "race/ethnicity "referred to any group of people who live in a particular geographical area or country aside from the native or the majority of the inhabited population. These groups include African Americans/Blacks, American Indians and Alaska Natives, Asians, Native Hawaiians/other Pacific Islanders, Hispanics/Latinos, and other minorities [33]. We searched literature including Medical Subject Headings (MeSH) of "social determinants of health" to

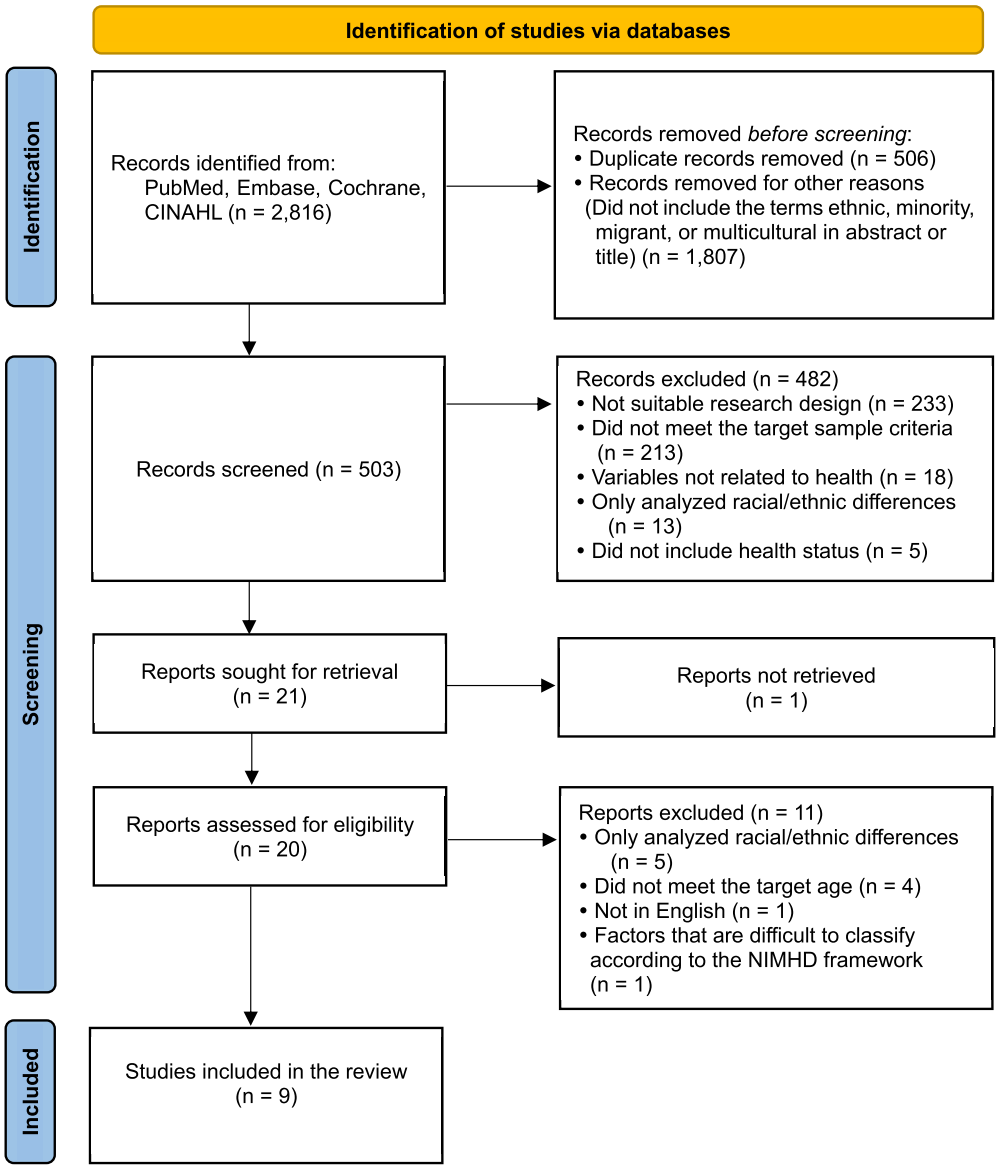

Fig. 1. PRISMA 2020 flow diagram for the literature search.
NIMHD = National Institute on Minority Health and Health Disparities.
From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021, p. 372:n71. https://doi.org/10.1136/bmj.n71

identify SDOH that affect REM adolescents. A comprehensive search of MeSH terms was completed using the keywords "ethnic groups" OR "minority groups" and "social determinants of health": (ethnic groups [MeSH terms]) OR (minority groups [MeSH Terms]) AND (social determinants of health [MeSH terms]). The search year was limited to the last five years from January 2016 to May 2021, and the age range was limited to ages 13–18 years through filter settings in PubMed, Embase, CINAHL, and Cochrane databases. This study aimed to comprehensively identify the SDOH that affect the health status of adolescents between the ages of 13 and 18 when puberty begins and rapid physical growth and interaction with others develop [4]. The age was limited to this group because it encompasses the period when adolescents were likely to be in high school. The study, therefore, focused on a specific cohort.

Articles were included if they met the following criteria: (1) focused on adolescents' health status (aged 13–18 years) and did not target adolescents with a specific disease, (2) were peer-reviewed, (3) were published in English, and (4) descriptive survey research. Articles were excluded using the following criteria: (1) studies that were specific to sexual minorities, patient samples, or South Koreans; (2) variables not related to health (e.g., residential mobility, gun violence, drug arrest rates); (3) analyzed only racial or ethnic differences; (4) articles not available in full-text (i.e., title or abstracts only); and (5) factors that were difficult to classify according to the NIMHD research framework (e.g., protective factors). We limited the scope of this review to descriptive survey research to identify the social determinants that have been found to be associated with adolescent health and in the context of the NIMHD research framework. Understanding these factors will provide a basis for future comparisons for adolescents in Korea. All studies included in the analysis were independently reviewed by two researchers. In cases where there was disagreement, two researchers reviewed the article together according to the data selection or exclusion criteria and opinions were compromised.

2.4. Data evaluation

The quality of the selected articles was assessed by the Mixed Methods Appraisal Tool (MMAT) version 2018 [34]. The MMAT was developed to evaluate the quality of research using a variety of methodologies, and its reliability has been demonstrated and used in a literature review in the field of nursing [35]. The MMAT checklist includes two screening questions (clear research questions, appropriateness of collected data) that apply to all types of studies. For quantitative descriptive studies, five criteria are used: (1) appropriateness of sample strategy to identify the research question, (2) representative sample, (3) appropriateness of measurement, (4) minimization of non-response bias, and (5) appropriateness of statistical analysis method. Using the MMAT to calculate an overall score is discouraged; more detailed information that includes the ratings of the methodological criteria is suggested so as to better represent the quality of studies. Two researchers independently evaluated the selected studies according to the appraisal criteria, and in cases of disagreement, consensus results were derived through discussion. Since the MMAT guidelines do not exclude studies rated as low quality, the researchers decided to include them all.

2.5. Data analysis and presentation

There are five domains of SDOH suggested by the NIMHD research framework: biological, behavioral, physical/built environment, sociocultural environment, and health care system [15]. The levels of determinants are divided into individual, interpersonal, community, and societal, and the health outcomes include individual health, family and organizational health, community health, and population health. The selected studies were analyzed based on the framework in which researchers added a "psychological" domain from five "domains of influence" of the NIMHD research framework in a previous study [30]. Based on this modified framework, two of the researchers read the selected studies and identified health problems and SDOH of REM adolescents.

Table 1
Methodological quality appraisal by the Mixed Methods Appraisal Tool.

Authors (Year)	Is the sampling strategy relevant to address the research question?	Is the sample representative of the target population?	Are the measurements appropriate?	Is the risk of nonresponse bias low?	Is the statistical analysis appropriate to answer the research question?
Assari et al. (2018) [43]	Yes	Yes	Yes	Yes	Yes
Cook and Tseng (2019) [38]	Yes	Yes	Yes	Yes	Yes
Cook et al. (2016) [39]	Yes	Yes	Yes	Yes	Yes
Cook et al. (2017) [40]	Yes	Yes	Yes	Yes	Yes
Held et al. (2020) [41]	Yes	Yes	Yes	Yes	Yes
Kapke et al. (2017) [42]	Yes	Yes	Yes	Yes	Yes
McCormack et al. (2019) [44]	Yes	Yes	Yes	Yes	Yes
Pike et al. (2018) [36]	Yes	Yes	Yes	Yes	Yes
Sladek et al. (2020) [37]	Yes	Yes	Yes	Yes	Yes

Table 2
Data extraction table.

No.	Authors (year)	Country	Purpose	Sample	Primary outcome(s)	Significant social determinants of health	Major findings
1	Assari et al. (2018) [43]	USA	To explore racial differences in the protective effects of maternal educational attainment at birth against poor self-rated health (SRH) of the youth 15 years later	F095 Fragile Families and Child Well-Being Study: longitudinal birth cohort study of American families F095 497 Whites (25.7%) and 1437 Carribbean Blacks (74.3%) N = 1034 F095 Age: 15 years old	Self-rated health	Gender	In Black youth, girls odds ratio (OR) = 2.01 for being more likely to have good SRH than boys.
2	Cook and Tseng (2019) [38]	USA	To identify socioeconomic and cultural profiles of subgroups of Asian American children at high risk of obesity or being overweight to inform targeted interventions	F095 2011–2016 National Health and Nutrition Examination Surveys F095 Asian American children F095 N = 841 F095 Age: 6–19 years old	Obesity (body mass index [BMI] at or above the 95th percentile) Overweight (BMI at or above the 85th percentile and below the 95th percentile)	Parental college degree (protective)	American children and adolescents in some Asian ethnic groups may be at higher risk of obesity/overweight than in others. Among adolescents ages 12–19, the interaction term between parental college degree and the child's US nativity was inversely associated with being overweight (Adjusted OR [AOR] 0.34; 95 % confidence interval [CI] 0.14–0.78).
3	Cook et al. (2016) [39]	USA	To identify specific profiles of Asian subgroups of adolescents at high risk of being overweight with special attention to Asian ethnicity, socioeconomic status (SES), and their interaction.	F095 California Health Interview Survey 2007–2012. F095 Asian American adolescents F095 N = 1533 F095 Age: 12–17 years old	Overweight	Gender Family income (less than 300 % of the federal poverty level)	Boys (OR = 3.20) were over three times more likely to be overweight than girls. Multiplicative interaction terms between low family income and two ethnicities, Southeast Asian and Vietnamese that had the lowest SES among Asian ethnic groups, were significantly associated with greatly elevated odds of being overweight (ORs = 12.90 and 6.67, respectively).
4	Cook et al. (2017) [40]	USA	To explore ethnic group SES as an indicator of community-level disadvantage that may influence being overweight/obese in Asian American adolescents	F095 2007-2012 California Health Interview Survey F095 Asian American adolescents F095 N = 1525 F095 Age: 12–17 years old	Overweight/obesity	Gender Family income	Low family income was significantly associated with obesity/overweight for all Asian American adolescents (AOR¼ 2.24) and for the U.S.-born (AOR¼ 2.99). Being male was a consistent predictor

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Table 2 (*continued*)

No.	Authors (year)	Country	Purpose	Sample	Primary outcome(s)	Significant social determinants of health	Major findings
							of being overweight/obese in all models.
5	Kapke et al. (2017) [42]	USA	To investigate the effects of acculturation and acculturation risk factors on early adolescents' perceptions of global self-worth.	F095 Urban setting, Non-probability sampling method F095 Latinx youth N = 79 F095 Age: 11–17 years old(mean age: 12.15 years old)	Global self-worth (scale: Self-Perception Profile for Adolescents): scholastic competence, social acceptance, athletic competence, physical appearance, job competence, romantic appeal, behavioral conduct, and close friendships	Acculturative stress Acculturation conflict MACVS (Mexican-American Cultural Values Scale for Adolescents and Adults) x perceived ethnic discrimination	Results suggested that specific cultural orientations were associated with increased global self-worth, and increased levels of acculturation risk factors were associated with decreased global self-worth. Acculturation conflict was the most salient predictor of global self-worth, and regression analyses indicated that the effects of acculturative stress, acculturation conflict, and perceived ethnic discrimination on global self-worth depended on youth's cultural orientation on the behavioral and cognitive measures of acculturation.
6	McCormack et al. (2019) [44]	USA	To examine the school height and weight data in a rural Midwest state to determine differences in overweight and obesity prevalence among youth by using Rural-Urban Continuum (RUC) codes to define county-level degree of urbanization	F095 De-identified data from the state Department of Health F095 White, Native American, multirace, Black, Hispanic, Hawaiian, Asian youth F095 N = 46,904 F095 Age: 5–18 years old	Overweight/obesity	RUC codes (Rural or non-Rural/Metro or non-Metro)	In multirace, Black, Hispanic, and Asian, odds of being overweight/obese were higher among rural youth compared to non-rural. In multirace, Black, Hispanic, and Asian, odds of being overweight/obese were higher among non-metro youth compared to metro.
7	Pike et al. (2018) [36]	Kenya	To examine how low intensity violence shapes health and well-being for African pastoralist youth	F095 Longitudinal panel study from 2008 to 2011 F095 Randomly sampled 215 households F095 N = 663 (Black, Boys = 335, Girls = 328) F095 Age: 10–20 years old	Anthropometric assessments -Height -BMI -Arm circumference -Skinfolds Self-Report Questionnaire-20 (≥15)	Household wealth Education level (<2 years formal education) Household death due to violence Health (health was coded as a dummy variable to indicate whether or not a teen experienced an illness during the seven days prior to a measurement.)	Nutritional findings indicate that teens ages 15–19 years had significantly higher anthropometric values compared to younger teens. Living in a wealthier household was associated with greater height, BMI, and summed skinfolds for boys but not for girls. Anthropometric measures were influenced by household and community variation in the mixed-effects, multi-level regression

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Table 2 (*continued*)

No.	Authors (year)	Country	Purpose	Sample	Primary outcome(s)	Significant social determinants of health	Major findings
							models. The Self-Report Questionnaire-20 was used to assess psychosocial health, with higher scores associated with living in a community directly affected by violence and having lost a loved one due to violence.
8	Held et al. (2020) [41]	USA	To examine the association between variables representing five discrete domains of SDOH and health and emotional well-being outcomes among youth of Latinx mothers	F095 Fragile Families and Child Well-Being Study F095 Youth whose mothers are Latina and their caregivers, 6-wave study (2014–17): N = 745 F095 Age: 15 years old in wave 6	Emotional Well-Being: 20 questions evaluating emotional status that included questions assessing depression, anxiety, and positive adolescent functioning	Gender Economic stability: poverty ratio Education: caregiver educational attainment, school culture, school climate, trouble at school Neighborhood/built environment: collective efficacy of the neighborhood (youth and caregiver report) Social and community context: adaptive social behavior, social skills, quality of relationship with caregiver	SDOH specific to social, educational, and neighborhood factors emerged as significant predictors of health and well-being. Findings suggest that several social determinants of health, including economic stability, education, neighborhood and built environment, and social and community context, are particularly important for Latinx adolescent well-being.
9	Sladek et al. (2020) [37]	Colombia	To examine the influence of racial and ethnic discrimination experiences and racial and ethnic identity on adolescents' psychosocial adjustment	F095 Six schools in Medellın, Colombia F095 N = 462 F095 Mean age: 15.90 years old	Self-esteem Depressive symptoms	Racial and ethnic identity Racial and ethnic discrimination	Experiencing more racial and ethnic discrimination was associated with lower self-esteem and higher depressive symptoms, whereas higher racial and ethnic identity resolution (i.e., gaining a sense of clarity about racial and ethnic group membership) and affirmation (i.e., feeling positively about racial and ethnic group membership) were associated with higher self-esteem and lower depressive symptoms. Racial and ethnic identity exploration (i.e., learning history and gaining knowledge about one's racial and ethnic group) was also associated with higher self-esteem and moderated the

(*continued on next page*)

Table 2 (*continued*)

No.	Authors (year)	Country	Purpose	Sample	Primary outcome(s)	Significant social determinants of health	Major findings
							association between discrimination and depressive symptoms, such that this association was stronger at higher compared to lower levels of racial and ethnic identity exploration.

3. Results

3.1. Study selection

Fig. 1 shows the PRISMA 2020 flow diagram with the results for identification, screening, eligibility, and included studies. As a result of searching the databases, a total of 2816 studies were identified. We excluded 506 duplicate articles and also excluded 1807 studies that did not include "ethnic" OR "minority" OR "migrant" OR "multicultural" OR "racial " in the abstract or title. After screening the 503 remaining studies, 494 articles were excluded because they did not meet the inclusion criteria for selection, resulting in nine articles being selected.

3.2. General characteristics and methodological quality appraisal of studies

Among the nine studies selected for analysis, one study was published in 2016 (11.1%), two in 2017 (22.2%), two in 2018 (22.2%), two in 2019 (22.2%), and two in 2020 (22.2%). Seven studies were conducted with adolescents in the United States, one study of three

Table 3
Social determinants of health classified according to research framework of this study.

Domains of influence	Levels of influence			
	Individual	Interpersonal	Community	Societal
Biological	F095 Gender [39–42] F095 Experience with illness [36]			
Psychological		F095 Acculturative stress [42]		
Physical/Built Environment				
Sociocultural Environment	F095 Racial and ethnic identity [37] F09F Cultural values [42] F09F Adaptive social behavior [41] F095 Social skills [41]	• Socio-economic status - Family income [39,40], - Household wealth [36]: participatory wealth ranking, livestock holdings, - Economic stability: poverty ratio [41] • Parental education level: college degree [38], Caregiver educational attainment [41] • School culture [41] • Household death due to violence [36] • Acculturation conflict [42] • Racial and ethnic discrimination [37] • Quality of relationship with caregiver [41]	• Rural-Urban Continuum codes [44] • Collective efficacy of the neighborhood [41]	
Health Care System				
Health Outcomes	**Individual Health**	**Family/Organizational Health**	**Community Health**	**Population Health**
	F095 Self-rated health [43] F095 Obesity or overweight [38–40,44] F095 Global self-worth [42] F095 Emotional well-being [41] F095 Anthropometric assessments [36] F095 Psychosocial adjustment [37]			

Black ethnic groups in Kenya [36], and one was conducted in Colombia [37]. Three studies [38–40] were conducted with Asian-American adolescents, one with African Black adolescents [36], and three with Latinx adolescents [37,41,42]. Of the other two studies, one was conducted with White and Black adolescents [43] and the other was conducted with White, Native American, multiethnic, Black, Hispanic, Hawaiian, and Asian adolescents [44]. Except for two studies [36,37], seven studies were secondary data analysis studies using public data and panel data.

The results of the methodological quality appraisal are provided in Table 1. All nine articles met the criteria for sampling for research questions, selection of representative samples, appropriateness of measurements, minimization of non-response bias, and appropriateness of statistical methods. Methods to reduce the risk of non-response bias, incentives, placement of household interviewers, and adjusting for post-examination were used. Table 2 provides a summary of the purpose, design, health outcomes, significant SDOH, and main results of the selected studies.

3.3. Health outcomes of REM adolescents

Health outcomes were classified into individual, family and organizational, community, and population health according to the NIMHD research framework (Table 3). All the health outcomes in the nine studies were in the individual domain. The health outcomes included four studies on obesity/overweight [38,39,44], one on self-rated health [43], one on global self-worth [42], one on emotional well-being [41], one on psychosocial adjustment [37], and one on anthropometric measurement [36]. The studies on obesity/overweight used BMI levels. Overweight was a BMI at or above the 85th and below the 95th percentile, and obesity was a BMI at or above the 95th percentile. Self-rated health and global self-worth were measured by self-report questionnaires. Emotional well-being included questions assessing depression, anxiety, and positive adolescent functioning. Psychosocial adjustment included self-esteem and depressive symptoms and was measured by self-report questionnaires. Anthropometric assessments were measured by the

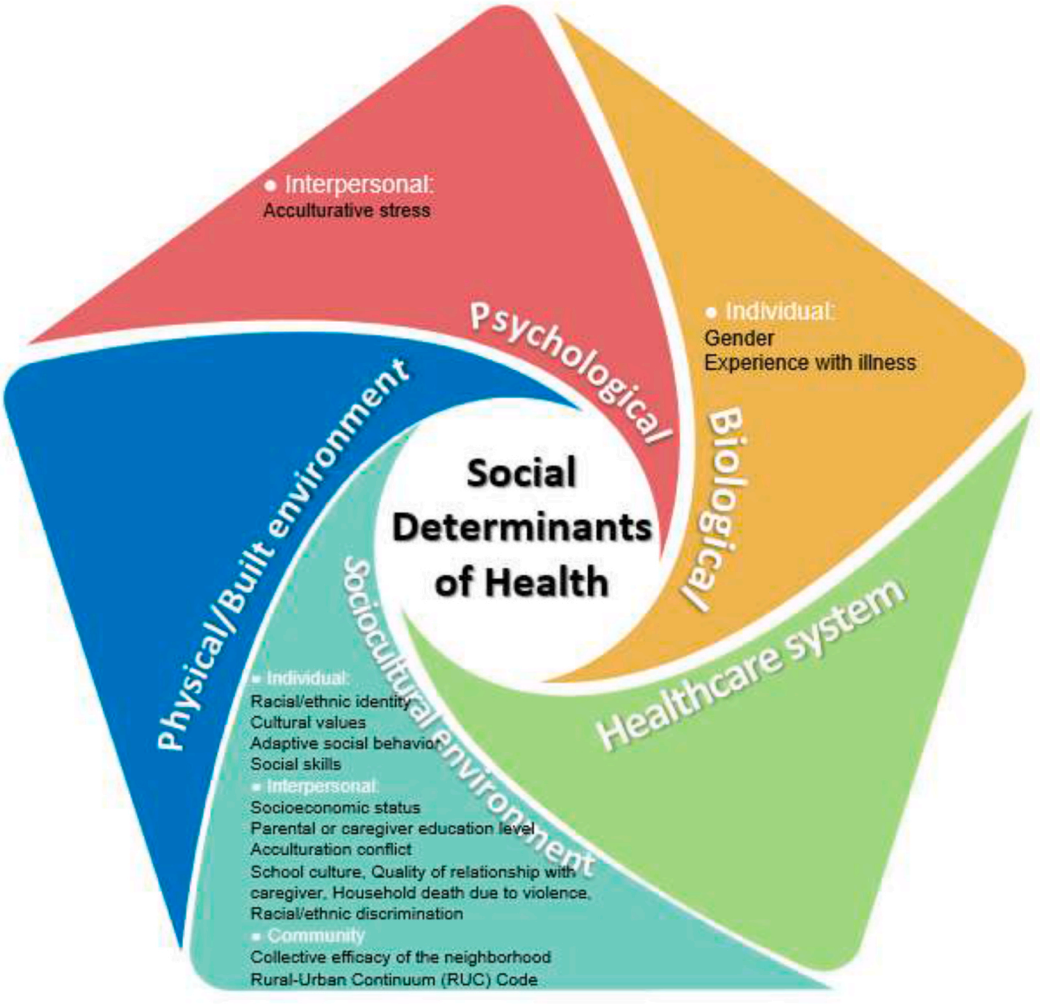

Fig. 2. Domain of social determinants of health in racial and ethnic minority adolescents.

research team and included height, weight, arm circumference, and triceps and subscapular skinfold measurements.

3.4. SDOH of REM adolescents

A total of 16 SDOH were identified that were associated with three out of four levels; no determinants were observed at the societal level (Table 3). At the individual level, determinants in the biological domain were "gender" and "illness experience," and the determinants in the sociocultural environment domain were "racial and ethnic identity," "cultural values," "adaptive social behavior," and "social skills." At the interpersonal level, the determinant in the psychological domain was "acculturative stress," and the determinants in the sociocultural environment domain included "socioeconomic status" (family income, household wealth, economic stability), "parental or primary caregiver education level," "school culture," "household death due to violence," "acculturation conflict," "racial and ethnic discrimination," and "quality of relationship with the caregiver." At the community level, the determinants in the sociocultural environment domain were the "Rural-Urban Continuum Code" representing urbanization and population size as the county-level degree of urbanization, and "collective efficacy of the neighborhood." Social determinants corresponding to the physical/built environment domain were reported in one study [41]. However, none of the articles reported on the healthcare system domain. The SDOH of REM adolescents is shown in Fig. 2.

4. Discussion

This integrative literature review identified the types of SDOH that can cause health disparities among REM adolescents. Based on these results, it is meaningful to analyze various determinants that should be considered in order for REM adolescents to develop into healthy adults.

Literature review on SDOH for REM adolescents that have been published since 2016 included the following types of studies: type 2 diabetes patients [45], obesity interventions for Hispanic children and families [46], modifiable risk factors for obesity in low-income African American and Hispanic children [47], and the health of children of adult non-Western migrants in Scandinavia [48]. However, while these reviews were able to identify determinants that affect the health of REM adolescents, our study identified the SDOH of REM adolescents based on the NIMHD research framework. The NIMHD research framework conceptualizes the factors causing the health disparities in multidimensional domains and levels, which contributes to a better understanding and promotion of minority health. Therefore, this study aimed to classify the determinants by area and level of influence, identify the variables mainly investigated in the study of the health of REM adolescents, and suggest the necessity of a study to analyze the relationships between various variables.

In this study, the investigation of the health status of REM adolescents was limited to participants who did not have a disease. As such, nine studies were reviewed that identified health statuses such as obesity or being overweight, self-rated health, and overall self-esteem. We focused on studies published from January 2016 to May 2021 (not including South Korea). The identification and use of nine articles in this review demonstrate the limited availability of quality studies that focus on SDOH among REM adolescents. In the studies of the SDOH of South Korean adolescents in "multicultural families" [49] and of immigrant children in Spain [50], well-being and the prevalence of overweight/obesity, respectively, were confirmed as health outcomes. Thus, the health outcomes presented in the nine studies reviewed in this review were similar. However, theNIMHD research framework noted that an individual's health status does not only affect the individual but can lead to collective or aggregate outcomes (e.g., smoking prevalence among individuals in schools or workplaces, adolescent pregnancy rates in communities, psychiatric readmission rates) [15]. Therefore, rather than exploring the health outcomes of socially vulnerable REM adolescents only at the individual level, we need to also examine the long-term effects of health disparities by investigating health outcomes within the family, peer group, school environment, and community.

In this study, the SDOH of REM adolescents were at the individual, interpersonal, and societal levels. The sociocultural, and environmental determinants were found to have the most influence on health status. In a study by Kim et al. [30] on the SDOH of REM adolescents in South Korea, at the individual and interpersonal level the influences were biological (gender, age, visible minority), psychological (self-esteem, ego-resiliency, stress, acculturative stress, family support, peer support, violence damage), and the sociocultural environment (living with family, economic status of the household, residential area, parental education level, parents' country of birth, and parenting attitude). These results are similar to the SDOH identified in the present study. Meanwhile, unlike the Kim et al. study [30], this study found discrimination against REM and racial and ethnic identity to be among the determinants in the sociocultural environment domain [51]. In addition, it was found that household death due to violence was a determinant related to the family, which is the most important context for adolescent growth. Thus, the determinants for REM adolescents in the United States, Kenya, and Colombia found in this study expand upon the SDOH identified in Kim et al.'s study [30] by identifying household problems as an important differentiator. With regard to discrimination, the health of REM adolescents in Asian countries has been affected. Specifically, teachers' discrimination against migrant adolescents had a negative effect on their mental health and a stronger effect on poor adolescents who received economic support according to income in China [52].

In this study, domains of the built environment did not have an influence on the health of REM adolescents. Among the nine studies analyzed, Held et al. [41] measured the built environment, which is usually defined as a physical structure or environment constructed for human activities [53], such as houses, schools, workplaces, parks, recreation areas, green roads, and transportation systems [54]. The collective efficacy of the neighborhood measured in the aforementioned study [41] was classified as a community-level and sociocultural environment domain based on the NIMHD research framework and showed no influence on the health of REM adolescents. However, it is difficult to draw conclusions about these factors as they have received very limited research attention in the reviewed studies. Moreover, the domain of the health care system was not investigated. The healthcare system domain was newly

added to the NIMHD research framework because of its relevance to the health of minority groups [15]. It is important that nurses who play a critical role in service provision and spend extended periods with the patients are aware of these SDOH and their interactions [55,56]. In situations where REM adolescents need healthcare services, it is expected that low health literacy or difficulties in decision-making processes will have negative health consequences [14,57]. Therefore, nurses should not overlook examining these determinants in the health management of REM adolescents.

By exploring the determinants in detail, researchers would have insights to prioritize the determinants for optimal physical and mental development during the early stage of adolescence [58]. In particular, adolescents grow up being influenced by the sociocultural environment of their family, peer group, school, and neighborhood [59]. Therefore, when conducting health research on socially vulnerable REM adolescents, it is necessary to consider the sociocultural environment as well as the physical/built environment, and policy domains. Improving the social environment in the daily lives of adolescents, in their families, schools, and relationships with peers, is required for enhancing adolescents' health [59]. It is worth noting that the findings of this study highlight the importance of the sociocultural environment domain in research on migrant health.

4.1. Limitations

This study has several limitations. The analysis was limited to studies targeting adolescents without disease, and the dependent variable was limited to adolescent health status, not adolescent health risk behaviors or specific diseases. As a result, studies that included smoking, alcohol and drug abuse, and decreased physical activity were excluded. In future research, it is necessary to further consider the SDOH by classifying in detail a wide range of variables indicating health status or health problems. In this study, we adopted a definition that emanated from theNIMHD research framework. Most of the reviewed studies also adopted this or a similar definition of REM adolescents. The case may be that these groups may be different in different countries and cultures. Yet, regardless of their specific ethnicity, the concept and SDOH may be similar. Therefore, we adopted this position to appropriately identify the SDOH in the context of the NIMHD research framework to provide an impetus for future studies in other cultures that be compared to this study. Another limitation was that we focused only on articles that were published in English language, and only those articles where the full text was available. It is therefore possible that perspectives derived from different cultural backgrounds of REM adolescents could be missed. Lastly, our focus was on descriptive survey research. As such, the review does not reflect causal determinants or a phenomenological perspective.

5. Conclusion

According to the results of our integrative review, the SDOH of REM adolescents can have negative personal health outcomes that may differ from that of the health outcomes of the dominant racial and ethnic group due to the complex link between social and structural determinants of health. In order to reduce the negative effects of racial discrimination and sociocultural and structural differences affecting the health of REM adolescents and their families, research needs to be conducted that considers the complexity of variables intertwined with health and the environment. Furthermore, recognizing social responsibility for adolescents' health along with the need for policy changes should be a priority.

Ethics approval statement

This study was an integrative review of the literature, and acquiring ethical approval from an institutional review board was not required.

Funding

This research was supported by the Basic Science Research Program through the National Research Foundation of Korea funded by the Ministry of Education [NRF-2020R11A2069894].

Data availability statement

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

CRediT authorship contribution statement

Youlim Kim: Conceptualization, Data curation, Methodology, Writing – original draft. **Hyeonkyeong Lee:** Conceptualization, Methodology, Project administration, Supervision, Writing – review & editing. **Hyeyeon Lee:** Investigation, Writing – review & editing. **Mikyung Lee:** Investigation, Writing – review & editing. **Sookyung Kim:** Investigation, Writing – review & editing. **Kennedy Diema Konlan:** Data curation, Investigation, Writing - review & editing.

Declaration of competing interest

The authors declare that they have no conflict of interest.

Acknowledgements

This research was supported by the Brain Korea 21 FOUR Project funded by the National Research Foundation of Korea (NRF) of Korea, Yonsei University College of Nursing.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.heliyon.2023.e20738.

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