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RESEARCH ARTICLE

Investigating the Impact of Young Parents' Demography on Child Wellbeing for Sustainable Development of Good Health and Wellbeing

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ABSTRACT

The importance of children's well-being to realize their potential is a hot topic that ignites intense focus in all societies, including parents, healthcare-related scientists, and researchers related to health care. Although there are many studies related to physiological and mental health to promote children's health development, they might not be impactful due to the rapid change in modern living styles these days. This study examines eight demographic factors in detail: background, lifestyle, social and emotional skills, education, marriage, financial status, criminal history, and health, among young parents that could contribute to developing their children's health. Big data analysis is the novelty of this study, which cleaned and transformed the ICPSR big data set (42 data sets with more than 90,000 records), resulting in a 1323 sample size and 231 variables as input into the correlation analysis using SPSS. The result shows the detailed variables of each predictor that influence the health of young adults. Other researchers can use these results to explore more evidence-based solutions to comprehensively monitor the health of current and future generations by clarifying the root causes and effects of demography, as they are the most critical point of influence for their children.

INTRODUCTION

The public is constantly concerned about children's health who are not yet competent and autonomous enough to preserve their health. Thus, their parents significantly impact their health. Parental factors have always impacted children's health, yet no one universally interprets this concept. In this study, a few elements of young parents' demography that influence children's healthy development are explored: background (Assari and Moghani Lankarani, 2018), lifestyle (Zhuge et al., 2020), social and emotional skills (Fan et al., 2020), financial status (Kim et al., 2018), education (Pesando,

2022), marriage (Auersperg et al., 2019), criminal history (Whitten et al., 2019), and health (Pietikäinen et al., 2020). This provides a clear perception of how parental traits impact children's health and encourages people to pay particular attention to these areas. The study aims to determine the possible connection of various parent demographies, not only to the usual elements of gender, age, and race but also to other demographic factors that comprise a distinct and significant concept in many aspects. All demographic-related events occur in every single family, comprising elders, parents, children, and the next generation of new energy to sprout. Due to the discrepancy in demographic transmission from the previous generation to the next in a wide range of family culture and behaviour-related evolutionary contexts, the bonds between parents and children in a broad demography have grown substantially more important to the world's population in recent years. The field of family demography is relatively new (Seltzer, 2019). However, there is still a vague insight into how family processes are happening regarding family members who live together and their interactions with each other, family structure, and specific behaviours and habits that could positively or negatively impact children.

'Parents' are referred to as young adults in this study, which becomes the novelty of this study, as marriage at an early age that leads to childbearing in this digital age produces new challenges for young adults and their parents. Children's well-being, personal traits, and normal social activities are the essence of a quality-oriented life that must be realized. One in seven adolescents (aged 10–19 years) has been reported to be globally confronted with untreated mental health problems (WHO, 2021). Although many studies have been carried out to identify the potential predictors of children's mental health issues, some proven factors include poverty, being bullied by peers or siblings (Patalay and Fitzsimons, 2018), Internet exposure, peer influence (Al Omari et al., 2020), and WHO (2021), which also listed harsh parenting and quality of home life as determinants of mental health. Family factors also appear to be important and require much research attention.

According to statistics, more than 19 million people in America suffer from social anxiety disorder (SAD) today. It is the most common anxiety disorder and the third most common mental health disorder in the country (Polaristeencenter, 2019). This includes fear of experiencing physical side effects that could humiliate people, such as blushing and trembling; severe anxiety or fear in public interactions; evaluating your performance and looking for shortcomings in your interactions after a social event; and anticipation of the worst possible outcomes because of a terrible social experience (Mayoclinicstaff, 2021). The stated problem has some negative outcomes, such as depression, suicide, and poor living standards for young people. Most people think that anxiety disorders occur in families. However, it is uncertain whether this is just a hereditary problem of their parent's background or history or if the child has learned this behaviour over the past time when in a situation where they are experiencing humiliation or embarrassment due to the high degree of attention being given.

On the other hand, parental incarceration is no longer an uncommon adverse childhood event, as incarceration rates in the United States have risen dramatically over the last half-century. Approximately 2.6 million children in the U.S. currently have a parent incarcerated, and most of those incarcerated have minor children (Poehlmann-Tynan and Turney, 2021). Children living in the same household with parents who have been or are incarcerated are theorized to be harmed and affected in health and well-being due to the stress caused by the experience. Children in the U.S. exposed to parental incarceration are more likely to have poorer health conditions than those not exposed to parental incarceration (Poehlmann-Tynan and Turney, 2021). Due to parental incarceration, their child could not acquire parental love, care, and warmth due to the absence of one or both parents. This leads to them having an incomplete childhood and degrading their mental health conditions. According to a previous study, parental incarceration has indeed been associated with poor or fair overall health, learning disabilities, developmental delays, speech or language problems, asthma, obesity, limited activity, and a variety of mental health problems such as attention deficit disorder/attention deficit hyperactivity disorder (ADHD), depression, anxiety, and behaviour or

conduct problems among children 0 to 17 years of age (Jackson et al., 2018).

Regardless of consanguineous marriage or polygamy prohibition over the decades, people today regard revering the monogamy concept (one husband, one wife) as a mainstay for long-term marriage relationships (Hasan et al., 2022). In the past, parental divorce had been restrained by politics and religion, but it became acceptable as an ordinary phenomenon in community-based actions in the 20th century (Auersperg et al., 2019). Subsequently, parental divorce has become one of the most ordinary experiences for children to witness and suffer through at a tender age (Garriga and Pennoni, 2022). Auersperg et al. (2019) noticed that there is an undulation on the parental divorce rate, which takes only over 48 years to increase from 0.8% in 1965 to 1.9% in 2013 and involves a population of 1000 persons in Europe (Auersperg et al., 2019). Parental divorce can lead to interrogation about children's adaptability to parental separation, and the consequences may result in self-injurious thoughts and behaviours (SITB) like suicide attempts (Wang et al., 2021). Without a doubt, children's psychological well-being will be affected due to parental divorce, in which several deliberations may be caused by personal problems and self-discipline to maintain marriage stability or parental conflicts, communications, and emotions between both parents (Garriga and Pennoni, 2022). A study is essential to investigate the prolonged and incessant in-depth causes from a critical parental point of view to their self-examination so that a breakthrough solution can be produced to rescue children's wishes for paternal and maternal love and concern for their entire infantile childhood and adulthood.

RELATED WORK

Parent's background and its impact on children's health

Background, such as race and culture, is the foundation of all traits that can influence parenting practice. According to previous research, different race parents (Hispanic, Native American, and white American) have shown a different level and severity of the obesity problem in children (Williams et al., 2018). The race of racial minorities may suffer from poorer health for their children, and it is overall protected for parents who come from equally racial groups with high socioeconomic status. This is because black and Hispanic youth will face worse health outcomes, such as aggression and psychological well-being, compared to white non-Hispanic youth (Assari et al., 2019). Meanwhile, whites will have more depression and other severe diseases than blacks.

In contrast, blacks, who require extra costs to promote social mobility, are always discriminated against and have a low income, resulting in poor health among the family, especially children (Assari and Moghani Lankarani, 2018). Due to the analogous similarity of socioeconomic status (SES) that overlaps in race and ethnicity, a low SES in terms of parental educational attainment (Assari et al., 2019) and low income have introduced an inequality in SES between cohorts of different races and ethnicities, especially for black and Hispanic youth. There is believed to be a significant relationship between race and ethnicity and SES (parental education attainment) on children's health outcomes. The association is significant for children of Hispanic ethnicity to have less aggression than white children, while black children will have less dependence on tobacco than white children (Assari et al., 2019).

Parents lifestyle and its impact on children's health

Furthermore, the lifestyles of young parents could be defined and explained by their social activities (e.g., volunteerism, habits), nutrition and diet, hobbies, etc. Lifestyles that include sleep disturbances, extreme low-intensity physical activities, and high exposure to media in daily life contribute to increased child mental health problems (Li et al., 2021). Research also shows that kindergarten-age children will be overweight or obese by 40%, increasing the rate by 40% if their parents smoke (Williams et al., 2018). Eating dinner together as a family can reduce the possibility that children are overweight or obese by 4% (Williams et al., 2018). Indoor tobacco smoke smell is shown to be strongly associated with most respiratory outcomes, and infancy will have a higher risk (Zhuge et al., 2020). Furthermore, parental abuse of drugs can cause mental health and behavioural problems that affect children's outcomes in growth and development, such as the worst cases of respiratory distress syndrome

and congenital malformations (Campelo et al., 2018). A significant association exists between maternal hazardous alcohol use and parental mental health. Parenting stress and anxiety will negatively affect their children's cognitive or emotional development and behavioural problems (Rochat et al., 2019).

Parents social-emotional impact on children's health

Social-emotional describes the social aspect and emotion, mental-related traits that may include personalities that determine the social relationship, such as friendship, and maturity and mindset perspectives. Child maladaptations were exposed due to poor social-emotional negative feelings of aggravation from parents that affect positive development regarding physical or emotional abuse, neglect, and household dysfunctions in their children (Suh and Luthar, 2020). A previous study by Fan et al. (2020) also shows a significant influence of income on a child's mental health, where subjective well-being can influence parents' personalities, such as extroversion (Fan et al., 2020). Subsequently, the psychological distress of parents in the workplace could also be one factor that affects the social-emotional well-being of young parents (Pang et al., 2022).

Parent's education and its impact on children's health

Parents with the same educational background will experience more stable decision-making processes that help significantly change the health outcomes of children from 1 to 15. The suggestion is that parental education similarity benefits infant health and reduces the possibility of infant preterm birth (Pesando, 2022). In addition, parents' educational background is claimed to be the main trait that determines their parenting style and the children's health status. This has also been explored in prior studies by Li et al. (2021), with a proven level of education possessed by parents that could reflect the stress level in the life situation (Li et al., 2021). Meanwhile, additional maternal education can increase children's weight and height by 0.03 kg and 0.06 cm, respectively, which is considered to positively impact the development of children's health (Le and Nguyen, 2020). Within the SES indicators, a higher level of education background and fewer stressful life situations owned by parents show lower mental health in children (Reiss et al., 2019).

Back in the old days, attitudes and actions toward consanguineous marriages were behaved like an adaptive, imperative behaviour under critical circumstances due to difficulty in finding an absolute matching spouse for sons or daughters in the family (Hasan et al., 2022), as well as forbidding the policy of polygamy, which is in the form of discrimination against women in some countries. Long after the history of equality, a marriage is perfect for a man and a woman to enable the joining and sharing of a spiritual pillar to continue living together in a stable physical journey. However, according to the previous study, conflict with the spouse has significantly contributed to the child's mental health problems. At the same time, family income has also been used as a secondary relating factor. Research has documented and shown that parental divorce or separation will have an increasingly risky condition that leads to an adjustment problem that includes disruptive behaviours (conduct and substance use problems), psychological problems, and a depressed mood for both children and adolescent health development. Lower-income and parent conflicts, breakups, and eventually divorce could have consequences for child health development, where research has documented that parental separation is associated with an increased risk of child adjustment problems, including depression (D'Onofrio and Emery, 2019). Sometimes, young children of separated parents who are experiencing unsuccessful marriage outcomes will have to occasionally confront events that are distressing and concomitant with unwell feelings toward them, such as the absence of parents during children's graduations, weddings, or other significant events that could be a heavy barrier that affects their emotional adjustment. This also mentioned the influence of attitude in marriage on child health development caused by immature parenting practices.

Parents financial status and its impact on children's health

It is also well-recognized that parents' financial status (e.g., low-income or middle-income level) is associated with the child's health conditions, and higher household income can reduce the chances of depression in children (Qi and Wu, 2020). Family

income positively and significantly influenced four indicators of a child's emotional well-being. 19% of children are verified to live in a family with difficulty with medical financial status, which will hamper children seeking a chance for health care until delaying the best time for access to health care (Sarathy et al., 2020).

Parents criminal background and its impact on children's health

A parent's criminal history is permanently recorded throughout their life. These records, regardless of whether it is a small type of conviction that does not reach the degree of incarceration, an arrest that did not result in any conviction at all, or a heavy and severe criminal being convicted, can affect children's future outcomes. Previous research showed that an estimated 7% of over 5 million children in the U.S. have experienced parents who lived with them going to prison or jail (Provencher and Conway, 2019). It is undeniable that the criminal history of one could affect others; it has emphasized the consequential effect on the health of children who are attached to the family, especially the father, as he is one of the members of a small group of parents who experience incarceration (Wildeman et al., 2018). Due to parental incarceration, the care or supervision of children may be complex in terms of financial insecurity, increased emotional stress, and strain on interpersonal relationships. Parental incarceration is believed to have a strong association with children's negative health conditions (Morgan-Mullane, 2017).

Parents health and its impact on children's health

A family health history may provide information on the higher risk of having common diseases or disorders such as heart disease, high blood pressure, and certain cancers that might influence a combination of genetic factors toward the future generation, which are their children. Equally important, several studies have suggested that parental health, particularly mental conditions, is highly conceivable to be directly related to their children. A more comprehensive description can be found in previous research on the proven association between parental mental illness and the high risk that their child will face health disadvantages (Pierce et al., 2020). Table 1 concludes previous studies with the detailed variables involved in research.

Table 1: Covariates of children's health based on previous studies

Covariate	Detail Variables	Previous Studies
Race and Background	Race/Ethnicity, childhood obese	(Williams et al., 2018)
	Racial gap, childhood asthma	(Assari and Moghani Lankarani, 2018)
	Race and ethnicity, socioeconomic factors as mediator, on child/infant's congenital heart problem	(Pierce et al., 2018)
	Race/ethnicity with parental educational attainment, marital status of parents, child outcomes: tobacco dependence, aggression, school performance, psychological distress, and chronic medical conditions	(Assari et al., 2019)
Lifestyle and daily activities	Parental smoking, childhood obesity	(Williams et al., 2018)
	Positive parental feeding, eating together, healthy home food environment, the pleasure of eating	(Haines et al., 2019)
	Parents' physical activity, progeny's phenotype	(Boron, 2021)
	The use of the Internet for information gathering for parents' own health and child health, feeding, and playing	(Laws et al., 2019)
	Parental Smoking, Children's Respiratory Outcome	(Zhuge et al., 2020)
	Parental abuse of drugs, Child Mental Health, and Behavioral Problems	(Campelo et al., 2018)
	Parental alcoholism, Child behavioral disorders	(Jose and Cherayi, 2020)
	Maternal alcohol use, Child's emotional-behavioural and cognitive development	(Rochat et al., 2019)
Social-emotional skill	Parents' feelings of aggravation, children's internalising, externalising and emotional problems	(Suh and Luthar, 2020)
	Parents' Extroversion, Parents' Neuroticism, Children's subjective well-being	(Fan et al., 2020)

Cont'.....

Covariate	Detail Variables	Previous Studies
	self-reported repair, mental health, inversely with self-reported attention	(Sanchez-Nūñez et al., 2020)
Educational background	Parental education, mental health problem	(Reiss et al., 2019)
	Parental educational similarity, children's health outcomes	(Pesando, 2021)
	Parents' education level, Child mental health	(Li et al., 2021)
	Education, Child's health	(Currie and Goodman, 2020)
	Race and ethnicity, socioeconomic factors (education level) as mediators, on child/infant congenital heart problem	(Peyvandi et al., 2018)
	Maternal education, child health: height-for-age, weight-for-age, weight-for-height	(Le and Nguyen, 2020)
	Maternal education and family structure: income, community size(background), children mental health	(Meyrose et al., 2018)
Marriage and attitude	Knowledge and attitude of parents about consanguineous marriages on child health outcomes	(Hasan et al., 2022)
	Parental divorce and parental migration, children's mental health, and self-injurious thoughts and behaviours, considering parent-adolescent communication and psychological resilience	(Wang et al., 2021)
	Domestic Violence against women, mental health of children	(Almiş et al., 2020)
	Interparental conflict, parenting irritability	(Vahedi et al., 2019)
	Long-term effects of parental divorce on mental health (suicide, anxiety, depression, alcohol, smoking, drugs, distress)	(Auersperg et al., 2019)
	Parental divorce, parental temporary separation	(Garriga and Pennoni, 2022)
Financial status	Parental socioeconomic status, mental health problem	(Reiss et al., 2019)
	Family income, children's health, and emotional wellbeing	(Qi and Wu, 2020)
	Family income, Medicaid, lack insurance	(Sarathy et al., 2020)
	Family SES (living above the poverty line), childhood asthma	(Assari and Moghani Lankarani, 2018)
	Parental objective social status, subjective social status, children's health-related quality of life	(Kim et al., 2018)
	Parents' Economic Status, Child's health	(Currie and Goodman, 2020)
	Socioeconomic status, children obesity	(Williams et al., 2018)
Criminal Background	Parental Offending History, Child's Physical and Mental Health, Child's Drug Use	(Whitten et al., 2019)
	Parental Incarceration, physical health, behavior, and mental health	(Wildeman et al., 2018)
	Toxic stress from parental incarceration (toxic stressors), negative health outcomes (asthma, ischemic heart disease), greater mental health problem than others, antisocial	(Provencher and Conway, 2019)
	Parental incarceration in jail and in prison, child well-being	(Poehlmann-Tynan and Turney, 2021)
	Parental incarceration, Child Health Difficulties, Child Chronic Physical Conditions, Developmental Disorders, Mental Health Conditions	(Jackson et al., 2021)
Health	Parental mental disorders, physical health in the offspring	(Pierce et al., 2020)
	Parental mental health	(Li et al., 2021)
	Trauma exposure, parental psychopathology	(Eruyar et al., 2018)
	Maternal, paternal depression, child emotional development/problems	(Pietikäinen et al., 2020)
	Alcohol Use Disorder (AUD) Effects on Child Development	(Shank et al., 2019)

Without a doubt, when there is a conversation about demography, age, gender, etc., that all belong to ordinary contributors, they are unceasingly providing a very first insight and initial mindset to every person when they ponder constituting a breakthrough solution for a certain drawback. However, scarce research emphasizes the combination of other demographic factors, including lifestyle, marriage, financial status, criminal background, and social and emotional skills, widely aggregated, combined, and jointly discussed with other common demographies such as races and backgrounds, health, and education, to prominently highlight the complicating consequences of these factors. These factors are intrinsically linked to the long-term development of children's health. Although other researchers are developing specific factors of parental behaviours or social-related outcomes on influence toward their children, this study aims to supplement the research gap by investigating the frequent change in parent demography in this era that could help to picture out the relevance of new critical points (Seltzer, 2019) on children's wellbeing when performing analysis on collective demographic factors of parents. The conceptual framework is then developed according to related works, as shown in Figure 1. Meanwhile, child health covers stage-appropriate capabilities (ability to succeed in the future) and child-appropriate ways (engagement with world ability) according to the theory of child wellbeing (Raghavan and Alexandrova, 2015).
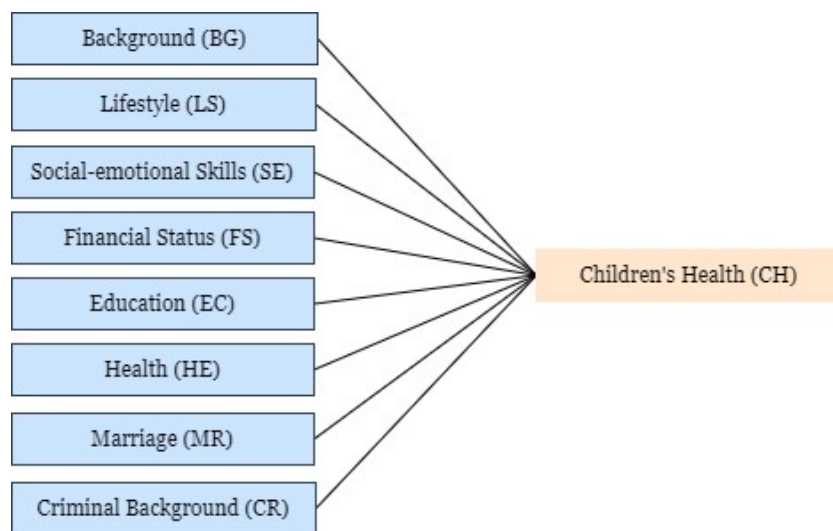

Figure 1: Conceptual framework of child health covariates (young parents demographic)

MATERIALS AND METHODS

The quantitative approach was implemented in this research by cleaning and transforming the large data set of the National Longitudinal Study of Adolescent Health (ICPSR, 2018), Wave III DS8 Demographic, DS12: Completed Pregnancies, and DS15: Children and Parenting. Eight dependent variables are identified from the 15 associated with 219 predictor variables. These datasets were cleansed and transformed using SPSS, adopting theTing et al. (2022) methodology for transforming large datasets for further analysis (Ting et al., 2022). The selected variables in three datasets are merged by using one-to-many merging based on key values (AID, RRELNO, RPREGNO, and BIRTHNO) into one dataset that automatically filters and gathers only the required cases with children. Data cleaning was performed in different ways: missing value > 30%, importance of the variable, existence of prerequisite question and its number of valid cases (> 500), creating a separate version for the variable (> 30%) with only valid cases (> 500), replacement value for the variable (<= 30%), as shown in Figure 2 below.
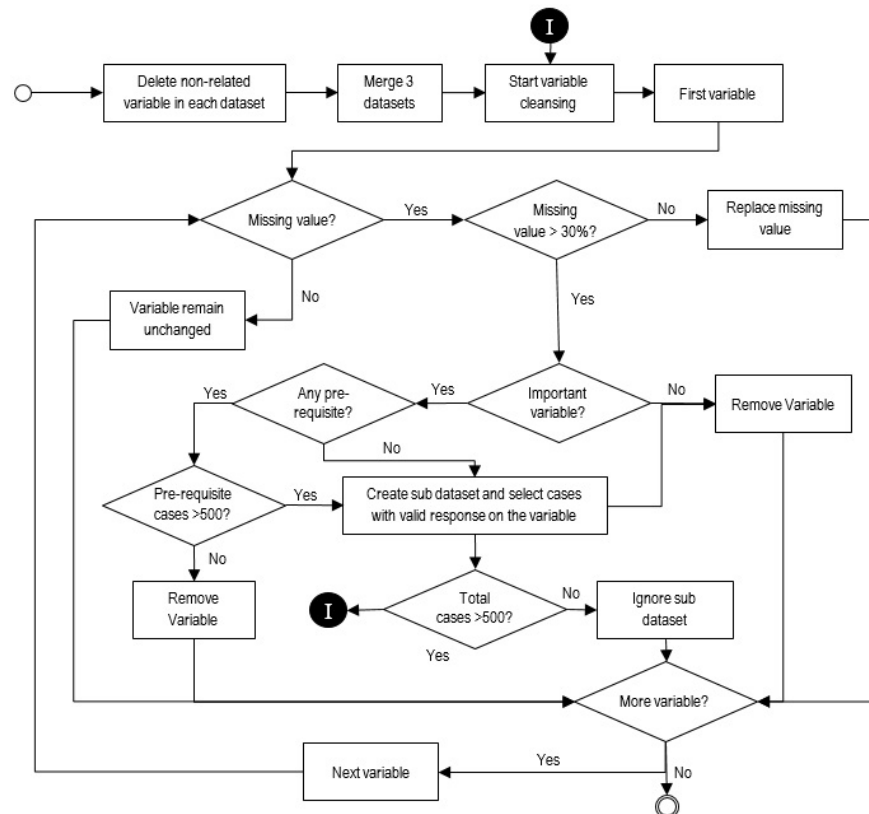
Figure 2: Diagram of the data set cleaning and transformation process flow

A variable with a missing value > 30%, calculated from Equation 1: Total Missing / (Total Valid + Total Missing), will be removed as it contributes to a low-quality, worst-case data analysis that may generate unstable results from what was expected. However, based on the importance and usefulness of variables in the subsequent analysis of the research objectives, Even when the variable to be removed (non-specific > 30%) is considered vital to the study, deep consideration is given to the prerequisite question of the current question constructed for this variable. The prerequisite question means that an answer to a particular question to be gathered is whether it is derived from or a continuous type of analogous meaning question from previously asked questions. The variable is removed if there are insufficient cases; < 500 cases are valid responses for the prerequisite question, implying that the meaning of the variable to be removed is inadequate to be used in the prerequisite question; otherwise, the variable to be removed on both non-prerequisite dependence questions or > 500 valid cases for the prerequisite question will be taken into account to create a separate version of the concrete data set by selecting only valid

responses for this variable to be analyzed. However, only valid cases > 500 for this variable will start creating a different sub-data set version and repeat data cleansing from the initial. In contrast, version creation will be neglected due to insufficient valid responses (< 500). Finally, the variable <= 30% of the missing data will be replaced by a specific value decision: mean, mode, "0," and other suitable values best adapted to the variable condition and type. The steps of data removal with consideration for the prerequisite question and replacement with an appropriate value are repeated until all are done.

A combination of 219 predictor variables (excluding AID, BIRTHNO, RRELNO, and RPREGNO) were selected from the base data set (424 variables) after performing data cleaning to be used to analyze the significance relationship of the variables in 8 dependent variables, as shown in Table 2. The variables for each demographic factor are 12 in background, 63 in lifestyle, 41 in social-emotional skill, 9 in education, 11 in marriage, 12 in financial status, 16 in criminal background, and 55 in health. The total number of cases remaining after the dataset merging is 1323 valid.

Table 2: Dependent variables: Child's condition with its questionnaire items

Dataset Label ID	Present Study's ID	Questionnaire Item
S25Q8	CH1	In general, how good is <CHILD>'s health?
S25Q9	CH2	Does <CHILD> have any physical, emotional, or mental condition that limits or interferes with his/her ability to learn?
S25Q10	CH3	Does HE/SHE have a condition that keeps HIM/HER from the activities other children HIS/HER age do routinely?
S25Q11A	CH4	Which of the following children's health problems has a doctor told you that <CHILD> has? Hearing problems or deafness
S25Q11B	CH5	Which of the following children's health problems has a doctor told you that <CHILD> has? Delayed speech or other problems with speaking or understanding
S25Q11E	CH6	Which of the following children's health problems has a doctor told you that <CHILD> has? Allergies or hay fever, not including allergic reactions to medications
S25Q11F	CH7	Which of the following children's health problems has a doctor told you that <CHILD> has? Asthma
S25Q11H	CH8	Which of the following children's health problems has a doctor told you that <CHILD> has? A chronic heart condition

RESULTS

All related covariates are identified and classified according to eight groups: background, lifestyle, social-emotional skill, education, marriage, financial status, criminal history, and health of young parents. Generally, health conditions contribute the most covariates compared to other categories (Table 3). It was found that there are a total of 42 covariates of child general health (CH1). Health has the most significant impact on general health since 31% of covariates are in this group. This is followed by social-emotional ability (29%), lifestyle (14%), and criminal history (9.5%). Surprisingly, criminal history has more covariates than parents' education, marriage conditions, and financial status.

Meanwhile, 36 covariates for CH2 are found: physical, emotional, or mental conditions that limit or interfere with the child's learning ability. The four categories of covariates are social and emotional skills (28%), criminal history (22%), parental health (25%), and lifestyle (14%). This has shown that young parents' daily lives and habits impact their learning ability. Young parents with criminal backgrounds and health problems will also indirectly affect the child's concentration during their learning process.

The experience passed on to young parents during their childhood will also affect the ability of their current children to interact with children of the same age in daily routine activities. 15 covariates (36%) are found in the young parents' health categories related to their current condition (CH3). This is followed by social-emotional skills (21%), lifestyle (17%), and criminal background (14%), which could affect the child's condition.

CH4-CH8 are children's conditions related to a specific problem: hearing problems, speech problems, asthma, allergies, and chronic heart problems. The criminal history covariables show less impact in these categories than CH1-3. Most of the covariates are related to lifestyle, social and emotional skills, and the health of the young parent. There are only 13 covariates related to CH4 hearing problems. This could be because the hearing problem has been inherited since birth and will not change much during growth. For the speech issue, 39 variables are related, which are parental health (31%), social-emotional skills (23%), and lifestyle (21%). However, lifestyle and parental health impact a child's allergy or hay fever (CH6). Lastly, the health category impacts children with asthma and chronic heart disease. Both health issues are considered an inheritance from the parents' health.

Child's General Health (CH1)

Background	Lifestyle	Social-Emotional Skill	Education	Marriage	Financial Status	Criminal Background	Health
Race-American Indian/Native	• Days Ate Fast Food Last 7 Days • Past Year Alternative Health Herb Remedy • Past Year Alternative Health Relax technique • Past 7 Days Enjoyed Life • Past 12 Months Birth Control Inject • Hours per Week Play on a Computer	• Past 12 Months Often Cried • Satisfied With Life as Whole • Compare to Other How Intelligent • Past 7 Days Felt as Good as Others • Past 7 Days Were Sad • Past 7 Days Have Many Good Qualities • Past 7 Days Have Lot Proud Of • Past 7 Days Like yourself • Past 7 Days Doing things right • Past 7 Days Not Follow Crowd • How Intelligent • How Attractive	• Highest Grade Completed Reg/sch • Received Highschool Diploma	Parental Separation	• Past 12 Months No Mortgage Payment • Past 12 Months No Util Payment • Own Stocks/Mutual Funds/Trusts	• 12 Months Join Fight/Group • 12 Months # Fight/Injured • 12 Months # Hurt One Bad/Care • No. Stopped by Police	• Age 5-12 Difficulty W/attention • Age 5-12 Failed to Finish Work • General Health • Lim: Vigorous Activities • Lim: Bending, Kneeling, Stooping • Diagnosed Asthma • Diagnosed Depression • Diagnosed Diabetes • Diagnosed High Blood Pressure • How Is Hearing • Past 7 Days Trouble Concentrating • Past 7 Days Were Depressed • Past 12 Months Diagnosed Chlamydia

Child's condition – limited ability (CH2)

Background	Lifestyle	Social-Emotional Skill	Education	Marriage	Financial Status	Criminal Background	Health
-	• Past 7 Days How Often Took Nap • Age First Time Sex • Past 12 Months Use Condom • Past 12 Months Male Sterilization • Hours per Week Watch Videos	• Past 12 Months Often Laughed • Past 12 Months Often Cried • Compare to Other How Intelligent • Past 7 Days Felt as Good as Others • Past 7 Days Depend Others • Change Lot Interests • How Popular • How Confident • How Independent • How Careful	• Highest Grade Completed Reg/sch • Received Highschool Diploma	Important Relationship - Love	Past 12 Months No Util Payment	• 12 Months Damage Prop/Not Yours • 12 Months Steal Something > $50 • 12 Months House Steal Something • 12 Months Weapon Get Something • 12 Months Use Cred Card • 12 Months Use Weapon/Fight • 12 Months Carry Gun to school/work • 12 Months # Hurt One Bad/Care	• Age 5-12 Left Seat • Age 5-12 Failed to Finish Work • Lim: Bending, Kneeling, Stooping • Diagnosed Depression • Past 7 Days Shake Off Blues • Past 7 Days Trouble Concentrating • Past 7 Days Were Depressed • Past 12 Months Diagnosed Trichomoniasis • Past 12 Months Diagnosed Urethritis

Child condition – keeps other activity (CH3)

Background	Lifestyle	Social-Emotional Skill	Education	Marriage	Financial Status	Criminal Background	Health
Ever Live in Foster Home	• To Exercise Center Past 7 Days • Past Yr Alternative Health Support group • Past 7 Days Enjoyed Life • Past 12 Months Male Sterilization • Hours per Week Watch Videos • Roller Blade or Skate or Ski or Aerobics • Gymnastics/Weight Lift/Strength	• Past 12 Months Often Cried • Compare to Other How Intelligent • Past 7 Days Depend Others • Try New Things • Get People Believe Me • Excited Lose Control • Follow Instincts • Stretch Truth • Change Lot Interests	• Highest Grade Completed Reg/sch • Received Highschool Diploma	-	• Past 12 Months No Util Payment • Past 12 Months Util Turned Off • Has Credit Card Debt	• 12 Months Damage Prop/Not Yours • 12 Months House Steal Something • 12 Months Weapon Get Something • 12 Months Carry Gun to school/work • 12 Months # Fight/Injured • 12 Months # Hurt One Bad/Care	• Age 5-12 Difficulty W/attention • Age 5-12 Left Seat • Age 5-12 Did Not Listen • Age 5-12 Felt Restless • Age 5-12 Failed to Finish Work • Age 5-12 Difficult to Be Quiet • Age 5-12 Felt on the Go • Age 5-12 Lost Things • Age 5-12 Blurted Out Answers • Age 5-12 Easily Distracted • Age 5-12 Difficult Wait Turn • Age 5-12 Forgetful • Past 7 Days Trouble Concentrating • Past 7 Days Were Depressed • Past 12 Months Diagnosed Trichomoniasis

Child has hearing problem (CH4)

Background	Lifestyle	Social-Emotional Skill	Education	Marriage	Financial Status	Criminal Background	Health
-	• Past Yr Alternative Health Acupuncture • Past Yr Alternative Health Relax technique • Past Yr Alternative Health Support group • Past Yr Alternative Health specialized diet • Roller Blade or Skate or Ski or Aerobics	• How Popular (SE33) • How Immature • How Independent	Received Professional Degree	-	-	-	• Lim: Bending, Kneeling, Stooping • Diagnosed Cancer\Leukemia • Stuttering Stammering Problem • Past 12 Months Diagnosed HPV

Figure 3: Covariates of child's health are classified into background, lifestyle, social-emotional skills, education, marriage, financial status, criminal history, and parent health

Child has speech problem (CH5)

Background	Lifestyle	Social-Emotional Skill	Education	Marriage	Financial Status	Criminal Background	Health
• Race-Black/African • Family Ancestry-2nd Country • Present Religion	• Past 7 Days How Often Took Nap • Vitamins or Minerals Last Month • Past Yr Alternative Health Support group • Past Yr Alternative Health specialized diet • Past 12 Months Diaphragm • Participate volunteer/community service • Attended church / Mosque • Bought Lottery/Scratch Ticket	• Past 12 Months Often Cried • Satisfied With Life as Whole • Past 7 Days Were Sad • Past 7 Days Like yourself • Past 7 Days Doing things right • Past 7 Days Depend Others • Change Lot Interests • How Confident • How Attractive	Received Professional Degree	Partner Lives with You	• Past 12 Months No Util Payment • Past 12 Months No $ to See Doctor • Past 12 Months No $ to See Dentist	• 12 Months Write Bad Check • 12 Months Use Weapon/Fight	• Age 5-12 Careless Mistakes • Age 5-12 Did Not Listen • Age 5-12 Felt Restless • Age 5-12 Failed to Finish Work • Age 5-12 Avoided Mental Effort • Age 5-12 Easily Distracted • Diagnosed Depression • How Is Hearing • Past 7 Days Bothered by Things • Past 7 Days Trouble Concentrating • Past 7 Days Too Tired Do Things • Past 12 Months Diagnosed Genital Herpes

Child has allergy/hay fever (CH6)

Background	Lifestyle	Social-Emotional Skill	Education	Marriage	Financial Status	Criminal Background	Health
• Present Religion • Religion Been Raised	• Am or Pm Usual Go Sleep • Vitamins or Minerals Last Month • Past Yr Alternative Health Chiropractic Treatment • Past Yr Alternative Health Folk Remedy • Past Yr Alternative Health Massage • Past Yr Alternative Health Relax technique • Past Yr Alternative Health specialized diet • Past Yr Alternative Health Vitamin therapy • Past 12 Months Birth Control Inject • Past 12 Months Emergency Contraception • Past 12 Months Male Sterilization • Attended church/Mosque • Often Pray in Religion Places • Work Around the House • Walk for Exercise	• Past 12 Months Often Cried • Past 7 Days Like yourself • Past 7 Days Like take risks • How Popular • How Attractive	Received Professional Degree	Married At Time of Birth	• Past 12 Months No Util Payment • Past 12 Months Util Turned Off • Past 12 Months No $ to See Doctor • Past 12 Months No $ to See Dentist	No. Stopped by Police	• Age 5-12 Talked Too Much • General Health • Lim: Vigorous Activities • Diagnosed Asthma • Diagnosed Depression • Stuttering Stammering Problem • Past 12 Months Diagnosed Genital Warts

Child has asthma (CH7)

Background	Lifestyle	Social-Emotional Skill	Education	Marriage	Financial Status	Criminal Background	Health
Ever Live in Foster Home	• To Exercise Center Past 7 Days • Past Yr Alternative Health Acupuncture • Past Yr Alternative Health Chiropractic Treatment • Past Yr Alternative Health Massage • Past Yr Alternative Health specialized diet • Past 7 Days Enjoyed Life	• Past 12 Months Often Cried • Past 7 Days Felt as Good as Others • Past 7 Days Were Sad • Past 7 Days Gut Feel Decisions • Past 7 Days Not thought future • Do Things How Fell Moment • Excited Lose Control • Change Lot Interests	Attend vocational or training	Partner Lives with You	• Past 12 Months Util Turned Off • Past 12 Months No $ to See Doctor	• 12 Months Sell Drugs • 12 Months Use Weapon/Fight • 12 Months # Hurt One Bad/Care	• Age 5-12 Talked Too Much • Age 5-12 Blurted Out Answers • Age 5-12 Difficult Wait Turn • General Health • Lim: Vigorous Activities • Lim: Bending, Kneeling, Stooping • Diagnosed Asthma • Diagnosed Cancer\Leukemia • Diagnosed Depression • Past 7 Days Were Depressed

Child has chronic heart condition (CH8)

Background	Lifestyle	Social-Emotional Skill	Education	Marriage	Financial Status	Criminal Background	Health
-	• Hour Usually Go Sleep • Walk for Exercise	• Try New Things • How Self-Centered	Educational attainment	• Living Together Time of Birth • Important Relationship – Love • Importance Relationship-Faithful (MR8) • Importance Relationship-Commitment	Has Unpaid Loans	-	• Lim: Bending, Kneeling, Stooping • Lim: Walking > a Mile • Lim: Bathing, Dressing Self • Past 7 Days Bothered by Things • Past 12 Months Diagnosed Genital Warts • Past 12 Months Diagnosed Urethritis • Past 12 Months Diagnosed Vaginitis

Figure 4: Covariates of child's health are classified into background, lifestyle, social-emotional skills, education, marriage, financial status, criminal history, and parent health

DISCUSSION

In this study, although parent-family history does not reveal many covariates concerning child health, some significant variables are still related to it. However, this result is supported by a study by Williams et al. (2018) showing that the American Indian/Native race has a higher chance of getting obese or overweight than white children (Williams et al., 2018). The possible reason American Indian or Native American children are more likely to get overweight is that their educational attainment is much lower than that of other races, and parents do not focus on their children's health. Meanwhile, Hispanic ethnicity will lead to critical congenital heart disease in newborns (Peyvandi et al., 2018).

Regarding young parents' lifestyle and social-emotional skills, it has many impacts on children's health. Fan et al. (2020) recognized that personal traits, including subjective well-being, are also correlated with their child's character, indicating the similarity with parents' social-emotional aspects (lifestyle) in this study. Loss of control, too often a change of interests, or changing habits will lead to parental aggravation of negative feelings that might negatively impact children's misadjustments in social life (Suh and Luthar, 2020). Other previous studies that support the result of this present study include covariates such as parental smoking (Williams et al., 2018), parental drinking (Wildeman et al., 2018; Rochat et al., 2019; Jose and Cherayi, 2020b), healthy eating style (Haines et al., 2019), extroversion personality (Fan et al., 2020), parental aggravation of negative feelings (Suh and Luthar, 2020), and many.

In terms of the achievement of the education of young parents, there is a positive impact on health (Currie and Goodman, 2020). However, Currie and Goodman (2020) present the congruence result. A possible explanation for this finding is that whether the attainment of parental education is high or low, it will still have an underlying implication on their children's health, significantly if it does affect the child's chronic heart disease. Other related covariates include parental education homogamy (Pesando, 2022), the additional year of receiving the educational level (Le & Nguyen, 2020), and the level of education level (Li et al., 2021; Reiss et al., 2019).

Although this study discovered fewer covariates related to child health under the marriage category of young parents, many previous studies support the correlation. Among the covariates presented by previous studies are: conflicts within a family (Vahedi et al., 2019), parents' absence of parents due to divorce, poor parents' marriage relationship (Wang et al., 2021), and temporary separation of parents (Garriga and Pennoni, 2022).

Financial status also shows a correlation with child health, which is supported by some previous studies, such as Sarathy et al. (2020), which show a significant relationship between parental medical financial hardship and poor children's health outcomes due to delayed health care and unmet health care needs (Sarathy et al., 2020). The financial burden creates a stressful life and eventually affects children's mental health (Reiss et al., 2019), psychosocial development (Kim et al., 2018), and even delayed speech ability (Qi and Wu, 2020).

The criminal background of young parents was found to greatly impact children's health in this study. This is supported by previous studies. For example, parental incarceration has bad consequences for poor general health, learning disabilities, speech problems, asthma, activity limitations, hyperactivity disorder (Wildeman et al., 2018), and physical, mental, and behavioural health problems (Provencher and Conway, 2019), and symptoms of internalizing disorders (Whitten et al., 2019). The present study shows that parents who frequently sell drugs will cause their children to suffer a future high-severity asthma condition. Drug abuse by parents that includes the consumption of cigarettes, alcohol, or non-prescribed substances is found to be associated with child maltreatment (Wildeman et al., 2019).

Young parents' physical and mental health has been proven to have a significant relationship with children's health. This is also supported by much previous research that includes covariates such as parental psychopathology and the influence of parenting stress on children's posttraumatic stress symptoms (PTSS) (Eruyar et al., 2018), parental mental disorders (depression) influencing children's asthma (Pierce et al., 2020), and many others.

Theoretical implications

This study has proven some covariates of children's health based on the non-medical data set ICPSR.

Combining with the previous studies, this present study has the following improved version of the theoretical frameworks: There are many covariates of child health, and therefore, it is suggested that researchers categorize the variables based on their positive or negative impact and large or average impact. This could help different parties (e.g., policymakers, parents, medical-related people) focus on different covariates based on the different types of impacts.
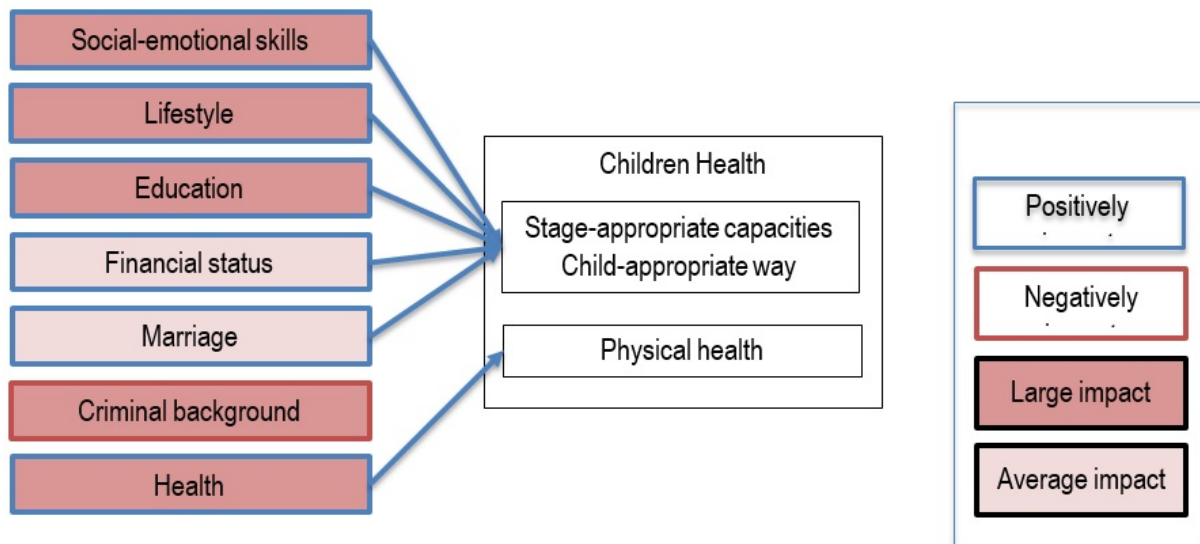

Figure 5: Theoretical implications of the present study

CONCLUSION

In this investigation, the objective was to assess the influence of young parents' demography on children's health and development, covering eight predictor categories: background, lifestyle, social-emotional skills, education, marriage, financial status, criminal background, and young parents' health. Although not all variables correlate with child health, a significant sum of variables in each category were significantly related to children's health, mainly lifestyle, social-emotional skills, criminal background, and parent health. The related variables are potential predictors of future work: machine learning-based predictive modelling of children's health based on parents' demographics.

A limitation of this study is that the selection of detailed variables for each predictor is subjective and is based on an opinionated judgment on deciding which predictor should be the most suitable class to include the candidate of detailed variables, as the data sets that have been opted for are not tailored for this study and have considerable coverage of aspects of the young parents. There is a possibility that the detailed variables that used to be assessed and grouped as predictors are miscategorized or some are removed due to a lack of proper definition of the variables since all understanding is entirely developed based on the information listed in the dataset's questionnaire. In addition, the study is also limited in terms of the adequacy of the data to be measured. The study has few variables for assessing children's development and disorders. Other health aspects, such as child depression, anxiety, ADHD, intellectual disability, and more mental and cognitive traits, are not covered and were not considered in the present study. Moreover, the project used a convenience sample, where the scope of the study is restricted to people in the U.S. but not a broader geographical area, intending to obtain widely applicable findings beneficial for further or future research.

More studies are needed to validate the selection of variables covered in the present study to a broader scope and possibly to conduct a customized questionnaire to gather data that can be used to answer the unclarified statements found in the present study. On reviewing the results discussed, several questions remain to be answered. In some

cases, future studies are suggested to assess whether parents enjoy their life overall rather than just the past 7 days for the lifestyle component. In addition to that, detailed work must be carried out to investigate the relationship between a healthy diet and children's asthma condition since a correlation is defined in our study. In terms of parental social and emotional performance, more research is required to study the effect of the independent level of parents on children's conditions that limit their ability to learn and to confirm the assumption that this could lead to mental conditions that limit their children's ability to learn. A broader scope of study shall be considered, not limiting it to a single sample but dispersing the responses to be elicited from different geographical areas that encompass a large population.

Authors' contributions

Conceptualization, T.T.T., N.Y.H., Joey, Mavis, C.S.Y.; methodology, T.T.T., N.Y.H., Joey; validation, T.T.T., C.J.K., Joey; formal analysis, N.Y.H., Joey, Mavis, C.S.Y., T.T.T.; investigation, N.Y.H., Joey, Mavis, C.S.Y., T.T.T., C.J.K.; resources, T.T.T., C.J.K., A.A., L.K.T.; data curation, N.Y.H., Joey, Mavis, C.S.Y., T.T.T.; writing—original draft preparation, N.Y.H., Joey, Mavis, C.S.Y., T.T.T.; writing—review and editing, T.T.T., C.J.K.; visualization, T.T.T.; supervision, T.T.T.; project administration, T.T.T., N.Y.H., C.J.K., A.A., L.K.T.; funding acquisition, T.T.T., L.K.T.

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