

Psychosocial Factors Related to Underuse of Medical Services

Chenshu Zhang, Judith S. Brook, Carl G. Leukefeld, and David W. Brook

ABSTRACT *In this longitudinal study, we applied structural equation modeling (SEM) to examine the historical, predisposing, enabling/barrier, and need factors as related to the underuse of medical services during early midlife. We gathered longitudinal data on a prospective cohort of community-dwelling men and women (N = 548) followed from adolescence to early midlife. The findings supported a mediational model: A mutually affectionate parent-child relationship in early adolescence was inversely related to underuse of medical services in early midlife via the mediational roles played by later predisposing factors (i.e., depressive mood and cigarette smoking), need factor (i.e., physical health problems), barriers (i.e., financial difficulty), and enabling factors (i.e., social support for health services in early midlife). In addition, satisfaction with medical services in the neighborhood had an association with less underuse of medical services in early midlife. Family therapy focused on an increase in the affectionate relationship between the adolescents and his/her parents and cognitive-behavioral treatment of depressive mood may lead to a decrease in the underuse of medical services.*

KEYWORDS *Longitudinal study, Underuse of medical services, Parent-child relationship, Depressive mood, Cigarette smoking, Physical health problems, Social support, Financial difficulty, Neighborhood medical services*

INTRODUCTION

Underuse of medical services has been widely documented in the literature.¹⁻⁵ There are serious and alarming consequences of the underuse of health care. For example, Farley and his colleagues³ estimated that increasing the use of nine clinical prevention services to more optimal levels could prevent 50,000-100,000 deaths each year among adults younger than 80 years of age. The CDC recently published a report⁴ on the underutilization of preventive services before the Affordable Care Act was passed. According to the report, just half of the adults living in the USA received clinical preventive services, such as screenings and prescription drugs, from 2007 to 2010.

Midlife is a unique developmental period which serves as a nexus between youth and older age. Midlife is also a period when health problems often become manifest

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Research Highlights • A distant parent-child attachment predicted underuse of medical services.

- Earlier depressive mood correlated with underuse of medical services.
- Financial difficulty was associated with underuse of medical services.

(e.g., diabetes, hypertension, cognitive deficits, body pain).^{6,7} However, many individuals in midlife are in need of, but do not access, medical services in a timely manner, including persons with high levels of substance use and/or physical health problems. Similar findings are true of those of lower socioeconomic status (SES) or of individuals who have lost their jobs and, with it, health insurance.⁸ It is important to understand the precursors and correlates of delayed health service use, which has been associated with several adverse effects, e.g., increased costs, poorer health outcomes, higher mortality rates, and greater human suffering.⁹ Our research is unique in that we use a multi-factorial longitudinal prospective model that examines both the interrelationships of psychosocial domains and the time ordering of these domains beginning in adolescence and extending to the underuse of medical services in adulthood.

Even though the underuse of medical services among individuals in midlife is documented, there is an extreme dearth of longitudinal information regarding how factors from earlier and contemporaneous developmental periods predict the underuse of medical services. Our study will aid in the identification of both longitudinal and contemporaneous factors for underuse of medical services in early midlife. Family Interactional Theory (FIT)¹⁰ and Andersen's Behavioral Model of Health Services Use (Andersen's HSU Model)^{11,12} were used as the theoretical frameworks for our study. Our model hypothesizes domains and pathways consistent both with FIT's premise of a developmental sequence of multi-factorial influences of which the early family interactions are paramount, and with Andersen's HSU model of multiple, contextual, and individual-level factors that operate to determine an individual's underuse of medical services. Consistent with FIT and Andersen's HSU model, we propose the following constructs that predict the underuse of medical services in early midlife: (1) historical and predisposing factors, including maladaptive early adolescent parent-child relationships, depressive mood from early adolescence to emerging adulthood, and cigarette smoking in young adulthood; (2) the need for services (i.e., physical health problems in early midlife); (3) barriers to services (i.e., financial difficulty in early midlife); and (4) the lack of enabling factors, including low social support for health services and low neighborhood medical services in early midlife. The hypothesized pathways linking these domains are presented in Fig. 1.

Historical and Predisposing Factors

According to FIT, a distant parent-child bond is associated with antisocial behaviors, which may result in psychological difficulties and substance use in the adolescent.¹⁰ Among the psychological difficulties, depressive symptoms are of significant public health concern.¹³ Often beginning in adolescence and extending to midlife, depressive symptoms influence physical health^{14,16} and social support from family and friends.¹⁷ Several studies have also found a direct association between a history of depressive mood and later underuse of medical services.¹⁸ Noncompliance or nonadherence to treatment recommendations is associated with depression in a variety of diseases.¹⁹

Among substance users, research has found that smoking is associated with underuse of health services.²⁰ This association may be indirect via the adverse effects of smoking on physical health, since smoking contributes to a number of physical diseases such as cancer, cardiothoracic illness, lung disease, and diabetes.^{21,22} Smoking also serves as a partial mediator between earlier psychological maladjustment and later physical diseases.^{23,24}

Need for Health Services

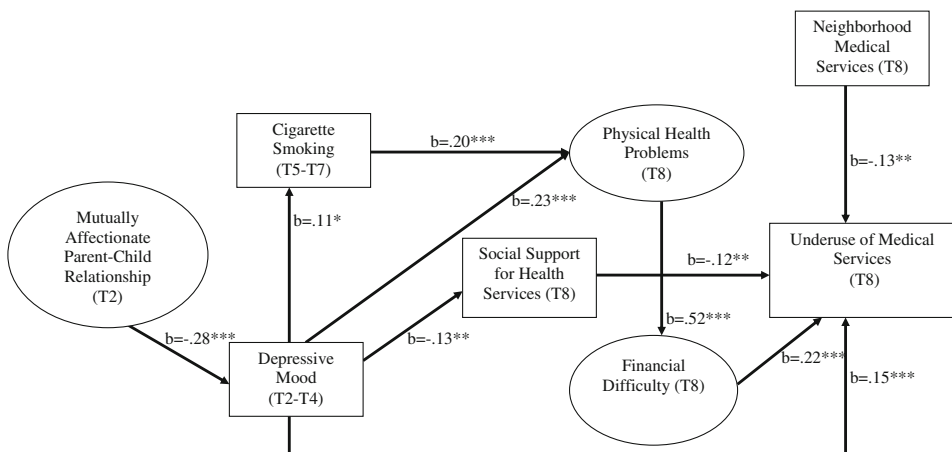
Presumably, greater need (i.e., physical health problems) is expected to be associated with more use of medical services. However, results about the association between physical health problems and the underuse of medical services are mixed.²⁵ These studies suggest that other health-related and non-health-related factors might mediate the association between physical health problems and the underuse of medical services. One of the important mediators is financial difficulty. Research has found that chronic health problems predict financial difficulty.^{23,26} Jensen and Li²⁶ found that, among adults in late midlife, cost-related nonadherence to prescribed medication (CRN) contributes significantly to reduced earnings and premature retirement, because CRN raises the risk that serious health problems will occur over time. Such adverse events subsequently limit an individual's ability to continue working and achieve and maintain financial stability and well-being.

Barriers

Research has also found that financial difficulty plays a significant role in the prediction of the underuse of medical services.^{1,5,27-29} For example, using the National Health Interview Survey (NHIS), Berkowitz et al.²⁷ estimated that approximately one in three chronically ill NHIS participants are unable to afford food, medications, or both. Bromley et al.²⁸ reported that financial obstacles, lack of insurance, decreased access to care, and intermittent primary care visits are associated with a lower likelihood of undergoing colorectal cancer screening in an at-risk African American population.

Enabling Factors

Substantial evidence has accumulated showing that social support is positively related to physical health and longevity.³⁰⁻³² For example, Steptoe et al.³⁰ reported that social isolation was associated with a higher rate of mortality, despite controlling for demographic factors and baseline health. With regards to health service use, Cornwell and Waite³³ found that social network characteristics (e.g.,



Note: 1. * $p < .05$, ** $p < .01$, *** $p < .001$; 2. CFI=.94, RMSEA=.04; 3. Gender, age at early midlife, and educational level at early midlife were statistically controlled; 4. T2=Early Adolescence; T2-T4=Early Adolescence – Early 20s; T5-T7=Early 20s – Late 30s; T8=Early Midlife.

FIG. 1 Standardized pathways (z-statistic) to underuse of medical services in early midlife ($N = 548$).

size of the network) and less emotional support are associated with the risks of undiagnosed and uncontrolled hypertension.

Another important enabling factor is neighborhood medical services. A growing number of studies have found that, compared to their more affluent counterparts, individuals living in lower SES neighborhoods exhibit maladaptive health behaviors and experience worse health outcomes.^{34,35} In a related vein, research has found that accessibility of medical services in the neighborhood is an important factor for missed or delayed use of medical services.^{36,37}

Hypotheses Based on FIT, Andersen's HSU model, and the empirical findings in the literature, we hypothesize that: (1) a mutually affectionate parent-child relationship in early adolescence is inversely related to depressive mood from early adolescence to emerging adulthood; depressive mood is directly related to later cigarette smoking in the 20s-30s; and depressive mood and cigarette smoking are positively associated with physical health problems in early midlife. Physical health problems are positively associated with financial difficulty in early midlife. Ultimately, financial difficulty is associated with underuse of medical services in early midlife; (2) depressive mood from early adolescence to emerging adulthood is associated with low social support for health services in early midlife; low social support has a direct association with the underuse of medical services in early midlife; (3) depressive mood from early adolescence to emerging adulthood has a direct association with underuse of medical services in early midlife; and (4) satisfaction with neighborhood medical services in early midlife has an inverse association with the underuse of medical services in early midlife.

METHODS

Participants and Procedure

Data on the participants came from a longitudinal psychosocial study of mothers and their children, begun in 1975 (T1). At T1, the participants' mothers were interviewed to assess problem behavior among their children. Population data from the census (updated in 1975) for sampling units in Albany and Saratoga counties were obtained. A systematic sample of primary sampling units (blocks) in each county was then drawn with probability proportional to the number of households. At the time the data was collected, the sampled families were generally representative of the population of families in the two upstate New York counties. There was a close match of the participants on family income, maternal education, and family structure with the 1980 U.S. census. Mothers with one or more child(ren) in the age range of 1-10 were recruited and, when there were multiple children in the family, one child in that age range was randomly selected. With regard to ethnicity, the sample was 90 % White, 8 % African American, and 2 % other ethnic/racial minorities. Forty-nine percent of the children were females. The detailed sampling procedures were published elsewhere.³⁸ Interviews of the participants were conducted in 1983 (T2, $N = 756$), 1985-1986 (T3, $N = 739$), 1992 (T4, $N = 750$), 1997 (T5, $N = 749$), 2002 (T6, $N = 673$), 2005-2006 (T7, $N = 607$), and 2012-2013 (T8, $N = 548$). The mean ages (SDs) of participants at the follow-up interviews were 14.1 (2.8) at T2, 16.3 (2.8) at T3, 22.3 (2.8) at T4, 27.0 (2.8) at T5, 31.9 (2.8) at T6, 36.6 (2.8) at T7, and 43.0 (2.8) at T8, respectively.

At T2–T7, extensively trained and supervised lay interviewers administered interviews in private. Questionnaires were self-administered by the participants at T8. Written informed consent was obtained from participants and their mothers in 1983, 1985–1986, and 1992 and from participants only in 1997, 2002, 2005–2006, and 2012–2013. The Institutional Review Board of the New York University School of Medicine approved the study procedures and the use of human subjects in this research study. Earlier waves of the study were approved by the Institutional Review Boards of the Mount Sinai School of Medicine and New York Medical College. Additional information regarding the study methodology is available in prior publications.³⁸

Measures

The Dependent Variable The dependent variable, underuse of medical services at T8, was a dichotomous variable. A participant was assigned a score of 1 if the participant reported that he/she ever ignored or delayed seeking help for a physical health problem in the past 12 months; otherwise, the participant was assigned a score of 0.

The Independent Latent Variables The independent latent/manifest constructs were (1) T8 physical health problems (four manifest variables, i.e., physical health problems in the past 12 months (Original), SF-36 general health,³⁹ SF-36 bodily pain,³⁹ and SF-36 physical functioning;³⁹ (2) T8 financial difficulty (four manifest variables, i.e., financial strain,⁴⁰ financial problems,⁴¹ health insurance status (Original), and household income before taxes (Original)); (3) T8 social support for health services (Original); (4) T8 perception of neighborhood medical services (Original); (5) T5–T7 frequency of cigarette smoking;⁴² (6) T2–T4 depressive mood;⁴³ and (7) T2 mutual affectionate parent–child relationship (three manifest variables, i.e., maternal affection,⁴⁴ paternal affection,⁴⁴ and resistance to maternal control.⁴⁵) Table 1 presents the sample questions, number of items, and Cronbach's alpha for each manifest variable.

Control Variables In the analyses, we statistically controlled for the following variables: T8 age, gender, and T8 educational level.

Data Analysis The present analysis ($N = 548$) is based on data from T8 of the longitudinal study. There were no statistically significant differences between participants included in the analyses ($N = 548$) and those who did not participate ($N = 208$) with respect to T2 age, maternal affection, paternal affection, and resistance to maternal control. However, there was a greater percentage of female participants (55.1 vs. 39.9 %; $\chi^2(1) = 14.72$, p value < 0.001) among participants who were included in the analyses, as compared to those who did not participate at T8.

A latent variable structural equation model (SEM) was used to examine the empirical validity of the hypothesized pathways. SEM is a multivariate statistical method that evaluates both the measurement quality of a set of variables used to assess a latent construct (the measurement model) and the relationships among the latent constructs (the structural model). To account for the influences of the participant's gender, age at T8, and educational level at T8 on these models, we used a partial correlation matrix as the input matrix. This was created by statistically

TABLE 1 Psychosocial scales, number of items, sample items, and Cronbach's alphas

Scale	Number of items	Sample item	Cronbach's alpha
Dependent variable			
Underuse of medical services (early midlife)	1	In the past 12 months, did you ignore completely or delay seeking help for a physical problem?	N.A.
Independent latent constructs and manifest variables			
Perception of neighborhood medical services (early midlife)	1	Are you satisfied with the medical services in your neighborhood?	N.A.
Social support for health service use (early midlife)	8	How true is it that you could get a ride to a medical appointment with a family member or friend if you needed to?	.88
Financial difficulty (early midlife)			
Financial strain	7	How often is it hard to live on your present income?	.92
Financial problems	14	Because of the current economic conditions, how true is it that you find it difficult to pay for food?	.92
Health insurance status	1	Do you have health insurance or health care coverage?	N.A.
Household income	1	During the past 12 months, what was your total household income before taxes?	N.A.
Physical health problems (early midlife)			
Physical health problems in the past 12 months	24	During the past 12 months, how long were you bothered by bronchitis or pneumonia?	N.A.
SF-36: general health	1	In general, what would you say your health is?	N.A.
SF-36: physical functioning	10	How much does your health limit you in lifting or carrying groceries?	.93
SF-36: bodily pain	1	How much bodily pain have you had during the past 4 weeks?	N.A.
Cigarette smoking (early adolescence–early 20s)	3	How many cigarettes do you smoke a day?	N.A.
Depressive mood (early 20s–late 30s)	3	Within the past few years, how much were you bothered by the following: feeling low in energy or slowed down?	.74–.78
Mutually affectionate parent–child relationship (early adolescence)			
Maternal affection	4	She frequently shows her love for me.	.72
Paternal affection	4	He frequently shows his love for me.	.70
Resistance to maternal control	5	He/she tries to see what he/she can get away with.	.88
Control variables			
Age	1	What is your age?	N.A.
Gender	1	What is your sex?	N.A.

TABLE 1 *Continued*

Scale	Number of items	Sample item	Cronbach's alpha
Educational level	1	What is the highest degree you earned?	N.A.

N.A. not applicable

partialing out (removing the effect of) the measure of the variables cited above on each of the original manifest variables in the present analyses. Our proposed model was estimated using Mplus.⁴⁶ The Mplus default option was used (i.e., full information maximum likelihood approach, FIML) to treat missing data. The advantage of FIML is that the results are less likely to be biased even if the data are not missing completely at random.⁴⁷ To account for the non-normal distribution of the model variables, we used the Mplus maximum likelihood with robust standard errors (MLR) as the estimator. We chose two fit indices to assess the fit of the models: (1) the root mean square error of approximation (RMSEA) and (2) Bentler's comparative fit index (CFI).⁴⁸ Values between .90 and 1.0 on Bentler's CFI indicate that the model provides a good fit to the data.⁴⁹ Values for the RMSEA should be below .10 to indicate a good fit. We also calculated the standardized total effects, which equal the sum of the direct and the indirect effects of each latent or manifest variable estimated in the analysis of the dependent variable.

RESULTS

Descriptive Statistics

Table 2 presents the response ranges, means, and standard deviations of the dependent, independent, and control variables used in the SEM analyses.

Path Analyses

For the measurement model, all factor loadings were significant ($p < .001$), showing that the manifest variables were satisfactory measures of the latent constructs. The factor loading matrix for the measurement model is available from the authors upon request. The RMSEA and Bentler's CFI were .04 and .94, respectively, reflecting a satisfactory model fit. The obtained path diagram along with the standardized regression coefficients is depicted in Fig. 1.

The results supported our major hypotheses: (1) A mutually affectionate parent-child relationship in early adolescence (T2) was inversely associated with depressive mood from early adolescence to emerging adulthood (T2-T4) ($b = -.28, p < .001$). Depressive mood was directly associated with cigarette smoking from the late 20s to the late 30s (T5-T7) ($b = .11, p < .05$) and physical health problems in early midlife (T8) ($b = .23, p < .001$). T5-T7 cigarette smoking was also directly associated with T8 physical health problems ($b = .20, p < .001$). Physical health problems were directly associated with T8 financial difficulty ($b = .52, p < .001$). Ultimately, T8 financial difficulty was directly associated with T8 underuse of medical services ($b = .22, p < .001$). (2) T2-T4 depressive mood was inversely associated with T8 social support for health services ($b = -.13, p < .01$). Social support had an inverse association with T8 underuse of medical services ($b = -.12, p < .01$). (3) T2-T4 depressive mood had a direct association with T8 underuse of medical services

TABLE 2 Descriptive statistics (N = 548)

Variables	Coding	Mean (SD) or %
Underuse of medical services (early midlife)	No (0)–yes (1)	26 %
Perception of neighborhood medical services (early midlife)	Does not exist (0)–very satisfied (4)	2.56 (1.55)
Social support for health service use (early midlife)	Never true (0)–always true (4)	3.26 (.81)
Financial difficulty (early midlife)		
Financial strain	Never (0)–almost always (4)	1.72 (1.00)
Financial problems	Completely untrue (0)–definitely true (3)	1.04 (.77)
Health insurance status	No (0)–yes (1)	94 %
Household income	U.S. dollar (\$)	96,800 (69,200–0)
Physical health problems (early midlife)		
Physical health problems in the past 12 months	Not in the past year (0)–more than 3 months (3)	0.38 (.32)
SF-36: general health	Very poor (1)–excellent (6)	4.05 (1.04)
SF-36: physical functioning	Yes, a lot (1)–no, not limited (3)	2.77 (.42)
SF-36: bodily pain	None (0)–very severe (5)	1.45 (1.27)
Cigarette smoking (early adolescence–early 20s)	None (0)–1.5 packs a day or more (5)	1.27 (1.55)
Depressive mood (early 20s–late 30s)	Not at all (1)–extremely (5)	2.09 (.53)
Mutually affectionate parent–child relationship (early adolescence)		
Maternal affection	Not at all like my mother (1)–very much like my mother (4)	3.36 (.59)
Paternal affection	Not at all like my father (1)–very much like my father (4)	3.06 (.70)
Resistance to maternal control	Not at all like my child (1)–very much like my child (4)	1.83 (.74)
Control variables		
Age (early midlife)	Years	43.03 (2.78)
Gender	Female (0)–male (1)	Males 45 %
Educational level (early midlife)	Less than a high school diploma (1)–doctoral degree or equivalent (6)	3.26 (1.30)

($b = .15, p < .001$). (4) T8 satisfaction with neighborhood medical services was inversely associated with T8 underuse of medical services ($b = -.13, p < .01$).

Standardized Total Effects

Table 3 presents the results of the total effect analyses. Each of the latent constructs had a significant total effect ($p < .01$) on T8 underuse of medical services. Among the

TABLE 3 Standardized total effects (*z*-statistic) of independent latent constructs on underuse of medical services in early midlife (*N* = 548)

Independent constructs	Underuse of medical services (early midlife) (<i>z</i> -statistic)
Mutually affectionate parent–child relationship (early adolescence)	–.05 (–3.68)**
Cigarette smoking (early adolescence–early 20s)	.02 (2.75)*
Depressive mood (early 20s–late 30s)	.19 (4.76)**
Social support for health services (early midlife)	–.12 (–2.74)*
Neighborhood medical services (early midlife)	–.13 (–3.08)*
Physical health problems (early midlife)	.11 (4.17)**
Financial difficulty (early midlife)	.22 (4.62)**

Gender, age at early midlife, and educational level at early midlife were statistically controlled

* $p < .01$, ** $p < .001$

constructs, T8 financial difficulty ($b = .22$, $p < .001$) had the greatest total effect on T8 underuse of medical services, followed by T2–T4 depressive mood ($b = .19$, $p < .001$).

DISCUSSION

To our knowledge, this is the first longitudinal study to examine the historical/predisposing factors, need factors, barriers, and enabling factors as related to underuse of medical services in early midlife. In contrast to prior studies, which were mostly cross-sectional, this study included prospective data spanning seven time points collected over the course of nearly 30 years. Our research focuses on seven potentially modifiable influences which are related to the underuse of medical services among individuals in early midlife: (1) a distant mutually affectionate parent–child relationship in early adolescence; (2) depressive mood from early adolescence to emerging adulthood; (3) cigarette smoking from late 20s to late 30s; (4) physical health problems in early midlife; (5) financial difficulty in early midlife; (6) low social support for health services in early midlife; and (7) low satisfaction with neighborhood medical services in early midlife.

Our results indicate that a distant mutually affectionate parent–child relationship in early adolescence has a significant total effect on an individual's underuse of medical services in early midlife. More specifically, individuals who had a greater mutually affectionate parent–child relationship in adolescence may experience less underuse of medical services in early midlife. Our results further suggest that there are multiple developmental pathways through which a mutually affectionate parent–child relationship in early adolescence may play a role in preventing later underuse of medical services.

In accord with FIT,¹⁰ the results indicate that an earlier more distant parent–child relationship predicts later increased depressive mood. As suggested by FIT, individuals with greater depressive mood may perceive their lives as more stressful⁵⁰ but may not have developed the skills to cope with these difficulties.⁵¹ Smoking, therefore, may be a means by which these individuals attempt to manage emotional dysregulation, as posited by the self-medication hypothesis.⁵² Consistent with numerous studies in the literature,^{21,22} our results indicate that greater smoking is associated with more physical health problems in early midlife. In accord with Jeon et al.,⁵³ greater physical health problems are, in turn, related to more serious financial difficulty. Financial difficulty in the present study has been conceptualized as the most proximal barrier to the use of physical health

services. A possible explanation for the relationship between physical health problems and financial difficulty has to do with the fact that individuals with on-going health problems may have difficulty obtaining or maintaining employment⁵⁴ and often have high medical bills. Likely mechanisms by which financial difficulty ultimately results in the underuse of medical services are varying earnings, high medical costs, lack of health insurance, and/or lower household income and resources.^{27,28}

Consistent with FIT, our findings indicate that greater depressive mood undermines one's ability and/or opportunity to obtain social support in adulthood. Social support typically refers to the functions (including emotional, informational, and instrumental assistance) performed for the individual by significant others and friends.⁵⁵ It also refers to social control,³¹ such that members of one's social network explicitly attempt to monitor, encourage, persuade, remind, or pressure the person to adopt or adhere to positive health practices (e.g., health service use) and discourage risky health behaviors. In accord with these views, the results of the present study indicate that increased social support for health services may help prevent the underuse of medical services.

With regard to the direct pathway from earlier depressive mood to later underuse of medical services, this result is in accord with the findings of Bogner and Wittink,¹⁹ who found that noncompliance or nonadherence to treatment recommendations was associated with earlier depression. Prior research has demonstrated that individuals with depression may experience impaired cognitive functioning, such as problems with concentration, and they may lack the task persistence needed to pursue their goals, including the prevention and treatment of physical illness.⁵⁶

Our results also indicate that satisfaction with neighborhood medical services is of importance in predicting less underuse of medical services. According to August and Billimek,³⁴ three mechanisms may be involved in the use of neighborhood medical services. First, low exposure to environmental stressors, such as neighborhood disorder, crime, and perceived safety, may improve an individual's self-regulatory capacity for adhering to effective health services. Second, exposure to social cohesion and to individuals exhibiting healthy behaviors may help the transmission of health-related information and may contribute to norms that value positive health behaviors. Third, individuals living in well-organized neighborhoods are more likely to have access to high-quality health care and social services.

Limitations

Some limitations should be noted. First, the present study relies on self-reported measures, which may be problematic in terms of their reliability and validity. However, many of the measures are reliable and have predictive validity.¹⁰ Second, earlier measures of the underuse of medical services were not available. Third, this study is limited because the sample was composed of predominantly white participants. Related to this, about 50 % of the participants lived in the Albany/Saratoga areas at T8. Therefore, the findings may not be generalizable to racial/ethnic minority groups or individuals living in other parts of the country. Future research should examine the pathways in more diverse populations. Fourth, the construct underuse of medical services was a manifest variable, because there was only one indicator measuring the occurrence of underuse. The study would have benefited from multiple manifest variables of this construct. Fifth, measurements of overuse or misuse of medical services were not available in the present study. Discussion of underuse needs to be received in the context of the widespread overuse or misuse of many services, which has received little attention in the literature.⁵⁷ Studying underuse, overuse, or misuse of medical services requires defining

appropriate use, which is a major goal of health care. Sixth, some participants were lost due to attrition. Had these nonparticipants been included in the analyses, it might have resulted in greater variability, which may have further strengthened our results.

Conclusions

Despite these limitations, the results of this research emphasize the significance of taking a lifespan perspective when identifying the predictors of the underuse of medical services. A mutually affectionate parent–child relationship, assessed at mean age 14, predicts predisposing, enabling, need factors, and barriers for underuse of physical health services. These findings, which are in accord with Andersen’s HSU model, have significant implications for preventive health and social policy. Similarly, our results are consistent with FIT which emphasizes the mediators between distant mutually affectionate parent–child relationships and the underuse of medical services. The mediators in this study include depressive mood, cigarette smoking, physical health problems, low social support, and financial difficulty.

From a public health policy perspective, emphasis should be directed to reducing the national rates of tobacco use which will decrease the need for medical services. In addition, increased social support for the utilization of medical services, the establishment of medical services in the neighborhood, and a reduction of financial difficulty may help to decrease the underuse of medical services. Given the importance of appropriate use of medical services, public education about treatment is critically needed. From an intervention perspective, family therapy focused on an increase in an affectionate relationship between adolescents and their parents, cognitive-behavioral treatment of depressive mood, and the effective treatment of individuals who smoke may reduce their physical health problems, leading to a decrease in the underuse of medical services.

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