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Exposures Associated With Minority High Schoolers' Predisposition for Health Science

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Abstract

Objective—To identify modifiable facilitation strategies (exposures) during high school that are associated with motivation for minority youth pursuit of health science.

Methods—A sample ($N = 116$) of minority (73% African American/Black, 21% Hispanic/Latino) 12th graders from 6 high schools in a lower socioeconomic area bordering Washington, DC completed a self-administered survey. Path modeling was used to examine whether: 1) exposures: high school science courses, extra-curricular science activities, personal health experiences, and adult encouragement predict Theory of Planned Behavior (TPB) constructs including Attitude, Subjective Norm, and Perceived Behavioral Control, and 2) TPB constructs predict the outcome of Intent to pursue college health science.

Results—The path model indicated that adult encouragement was associated with Attitude ($p < .001$), Subjective Norm ($p < .001$), and Perceived Behavioral Control ($p < .001$); and personal health experiences were associated with Attitude ($p < .001$). Attitude and Subjective Norm were associated with Intent ($p < .001$).

Conclusion—Motivating minority high schoolers from low socioeconomic areas through adult encouragement and personal health experiences to value health scientists and to perceive that others support their pursuit of health science may be pathways for facilitating their intention to pursue college health science.

Keywords

adolescents; career choice; health science; high school; minority health; Theory of Planned Behavior

To better address health disparities disproportionately burdening non-Whites in the United States, an increase in the number of minorities in the health science workforce is needed.

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Human Subjects Approval Statement

Public school and university [Reference #: 10-0387] Institutional Review Board (IRB) approvals were obtained for this research study.

Conflict of Interest Disclosure Statement

The authors report no conflict of interest that may have influenced either the conduct or the presentation of research, including but not limited to close relationships with those who might be helped or hurt by the publication, academic interests and rivalries, and any personal, religious or political convictions relevant to the topic at hand.

Unfortunately, even among minority high school students who are gifted in health-related science, the majority do not end up pursuing college health science and obtaining a health-related occupation.¹⁻⁴ As many health-related professions require at least some college-level health science education, high school student intent to pursue college health science is extremely important for the health career pipeline. Identification of the predictors of intention to pursue college health science among minority high school students beyond traditional academic exposures to health-related science may help to improve promotion of health science among minority high school students. Furthermore, evidence supporting a predictive theoretical framework may help to guide research in this area.

Between 2009 and 2034, the overall prevalence of chronic conditions is projected to increase dramatically in the United States (US). For example, diabetes, which disproportionately affects Blacks, will increase from 23.7 million to 44.1 million cases per year, and diabetes-related spending will increase from \$113 billion to \$336 billion.⁵⁻⁷ Cancer, diabetes, hypertension, pulmonary conditions, heart disease, mental disorders and stroke are all projected to dramatically increase in prevalence, disproportionately so among minorities. Unfortunately, the future health workforce is not projected to include a diverse enough group of health professionals to address this burden. Health scientists from majority and higher socioeconomic backgrounds may lack the familiarity and perspective needed to address health disparities of minority persons and those from low-income backgrounds.^{8,9} The health research workforce continues to be underrepresented by Blacks, Hispanics, and Native Americans relative to the US population.¹⁰ Blacks make up 8% of biological scientists, 7% of medical scientists, 5% of environmental scientists, 4% of psychologists, and less than 1% of sociologists.¹¹

Barriers to minority pursuit of college health science are not well understood but may be related to financial needs, academic needs, social isolation, and experiences of discrimination from teachers and peers. For students of newly immigrated families, limited English language competency could additionally play a role.^{4,12,13} Commitment of urban minority high school youth to academic and career aspirations may be strongly associated with adult encouragement.¹² Among freshmen African American students interested in science, those who participate in first year college health science research programs tend to have stronger social confidence.¹⁴

Attitude, Subjective Norm, and Perceived Behavioral Control are constructs proposed by Fishbein and further elaborated on by Aijzen in the Theory of Planned Behavior (TPB) to predict health intentions and behavior.¹⁵⁻¹⁷ Attitude is conceptualized as salient beliefs about the consequences of a particular behavior and evaluation of the salient beliefs related to the behavior. Subjective Norm is conceptualized as the strength of one's perceived social expectations and motivation to comply with those expectations about the behavior. Perceived Behavioral Control is the perceived likelihood of occurrence of facilitating or constraining conditions, and the perceived effect of each of the facilitating or constraining conditions on the behavior.

The TPB is based on the premise that one's voluntary behaviors emerge from one's intentions. Intentions arise from cognitions related to the TPB constructs Attitude,

Subjective Norm, and Perceived Behavioral Control.¹⁷ Examination of influence of youth experiences and activities on the TPB constructs, and influences of the TPB constructs on youth intention to pursue college health science may improve understanding of the trajectories of youth pursuit of college health science and facilitate more effective strategies to influence youth intentions regarding college health science. To lend support to the potential value of TPB as a predictor of youth pursuit of college health science, a study focusing on women's gender-role attitudes and perceptions of other's expectations (TPB-based constructs) predicted women's career choice up to 14 years later.¹⁸

There are several possible youth experiences and activities (exposures) that may influence the motivational constructs of TPB (Attitude, Subjective Norm, and Behavioral Beliefs) which in-turn may be related to intention to pursue college health science. Four such exposures include high school science courses, extra-curricular science activities, exposure to personal health-related situations,¹⁹ and adult encouragement.²⁰ As depicted in Figure 1, these exposures could influence Attitude, Subjective Norm, and Perceived Behavioral Control as the routes to changing intention to pursue college health science. Conversely, one or more of these strategies may have little impact and not warrant a major outlay of resources for promoting minority youth pursuit of college health science education and careers.

The present exploratory study uses data from the longitudinal study entitled "Climbing Up and Reaching Back" (CURB), which was designed to identify predictors and test educational materials and face-to-face mentoring interventions to increase pursuit of college health science among minority high school students living in a lower socioeconomic area. The study subjects were surveyed from the 10th through the 12th grades. Although the parent study was an intervention trial with 2 study conditions, multiple analyses indicated that there were no differences in any key study variable by study condition. Therefore, to better understand the ultimate influences on the students' intention to pursue college health science as they finished high school, we embarked on a path analysis. Path analysis can assess the relationships among variables and the plausibility of a particular model for explaining an outcome. Path analysis was used to examine whether: 1) high school science courses, extra-curricular science activities, personal health experiences, and adult encouragement are associated with Attitude, Subjective Norm, and Perceived Behavioral Control and 2) Attitude, Subjective Norm, and Perceived Behavioral Control are associated with the outcome of intent to pursue a college-level education in health science.

METHODS

Subjects were recruited from 6 high schools in a low socioeconomic area near Washington, DC with a predominantly minority race/ethnicity population provided study subjects. There were multiple steps for eligibility for project participation as follows. For youth to participate in CURB, students had to be enrolled in the 10th grade as of November 2011 at one of the participating high schools and have a cumulative grade point average of B- or higher (N = 689). Participating school principals were provided the names of students by central school administration. Staff recruiters, designated by school principals, then eliminated students from the list with developmental disabilities requiring special classroom

assistance as they could not be accommodated in the study. If students met the necessary requirements, the designated school staff confidentially approached the students face-to-face and provided them with an envelope containing a detailed explanation of the program and the enrollment process. All students who returned a completed consent form from a parent and a self-signed assent form by initiation of the study could participate further in CURB (N = 173), and 134 students actually participated in the first study survey in the 10th grade. The cohort then completed the survey each subsequent spring semester through 2013 when they were finishing the 12th grade (N = 116). The surveys were confidentially self-administered by subjects in large lecture halls under the supervision of trained research assistants. Survey subjects received \$10 as an incentive at baseline and the incentive increased \$5 for each subsequent completed survey.

The survey instrument was designed and revisions were reviewed by a team of researchers including behavioral scientists, university students, parents, and high school students. Existing items from the literature were used whenever possible but new items were also developed for the survey. The survey was pretested with high school students from schools not involved in the study to assess student ease of completion, comprehension, and acceptability. Two rounds of review and pretesting with 10 students, both male and female, in each round were conducted and several rounds of revisions were made by the research team before the survey was administered for this study.

Attitude

Sets of survey questions previously developed²¹ to assess affinity to particular professional careers was slightly modified for this study by the research team as described previously to describe affinity to a career as a health scientist.²² The items and scoring methods to derive Attitude used in this study specifically reflect the “belief” and “evaluation” items and scoring methods proposed by Fishbein and Azjen.²³ To measure beliefs, students were assessed with 25 items rated on a semantic differential scale from 1=“*not likely*” to 7=“*very likely*.” Students were asked to “*Circle the number that corresponds with how likely it is that the statement is true.*” Examples of statements included “*Health scientists will always have a job,*” “*Health scientists work very hard,*” and “*Health scientists are respected*” To measure parallel evaluations of those beliefs, students were assessed with 25 items rated on a 7-point semantic differential scale ranging from 1=“*I don’t want this*” to 7=“*I want this very much.*” Students were asked to “*Circle the number that corresponds with how much you want each of the following.*” Examples of items included “*Always have a job,*” “*Work very hard,*” and “*Have respect.*” The 25 parallel belief and evaluation items were multiplied and the final Attitude score was the mean of these products. Higher scores represented more positive attitude toward being a health scientist. The internal consistency reliability for the Attitude construct was excellent (Alpha= 0.91).

Subjective Norm

The research team created questions reflecting Fishbein and Azjen’s conceptualization of the 2 components of Subjective Norm, including “normative beliefs” and “motivation to comply,” as well as scoring procedures.²³ Seven items measured normative beliefs regarding parents, teachers, friends, classmates, neighbors, community, and ethnic/racial group (eg

“My parents expect me to pursue a college education in health science.”) Students were asked to *“Circle the number that corresponds with how much you agree with each statement”* and responses were rated on a 7-point semantic differential scale ranging from 1=*“Strongly Disagree”* to 7=*“Strongly Agree”*. Seven parallel items measured motivation to comply (eg *“I try to do what my parents expect of me”*). Responses were rated on a 7-point semantic differential scale ranging from 1=*“Strongly Disagree”* to 7=*“Strongly Agree”*. Using the Fishbein and Azjen scoring method,²³ normative belief and parallel motivation to comply items were multiplied, and a mean of these products was used as the Subjective Norm score. Higher scores represented stronger feelings of social expectation about pursuing a college education in health science. The internal consistency reliability for the Subjective Norm construct was excellent (Alpha= 0.92).

Perceived Behavioral Control

The research team created 2 sets of parallel questions reflecting Azjen’s conceptualization of the 2 components of Perceived Behavioral Control, including “control belief” and “perceived power”, as well as scoring procedures.²⁴ Five items measured control beliefs regarding entrance into a college health science program and addressed tuition expenses, grades needed for acceptance, complexity of the application process, SAT scores needed for acceptance, and high school science courses (eg *“Good grades are necessary to be accepted into college health science”*). Responses were rated on a 7-point semantic differential scale ranging from 1=*“Strongly Disagree”* to 7=*“Strongly Agree”*. Five parallel items measured perceived power (eg *“I can earn good enough grades to be accepted into college health science.”*). Responses were rated on a 7-point semantic differential scale ranging from 1=*“Strongly Disagree”* to 7=*“Strongly Agree”*. The 5 parallel items from the 2 sets were multiplied and the final Perceived Behavioral Control score was the mean of these products. Higher scores represented stronger feelings of barriers to pursuing a college education in health science. The internal consistency reliability for the Perceived Behavioral Control construct was fair (Alpha= 0.70).

Science Courses

The number of self-reported science courses was measured as a count of any of the following courses taken in high school: Biology, chemistry, physics, geometry, calculus, math, statistics, algebra, health, psychology, environment, and sociology.

Extra-Curricular Science Activities

The number of self-reported extra-curricular science activities was measured as a count of student endorsement that they had participated in any of the following while in high school: *“high school science programs or groups during the school day,” “high school science programs or groups after school,” “non-school science programs or groups,”* or *“summer science programs or groups.”*

Personal Health Experiences

Students were asked their level of agreement with 5 items: “I have had personal experiences that make me interested in health,” “I have known someone who died too young from a

health problem,” “I have known someone who had a poor quality of life because of a health problem,” “Poor health of another person has affected my life,” and “My own health problems have affected how I think about health.” Response options were on a 7-point semantic differential scale ranging from 1=“strongly disagree” to 7=“strongly agree”. The responses were averaged. The internal consistency reliability of the multi-item scale was good (Alpha= 0.80).

Adult Encouragement

Students were asked their level of agreement with 4 items: “I know adults who encourage me often,” “I know adults who encourage me often in sciences,” “Most of the adults I know are good role models for me,” and “I have good adult science role models.” Response options were on a 7-point semantic differential scale ranging from 1=“strongly disagree” to 7=“strongly agree.” The responses were averaged. The internal consistency reliability of the variable was fair (Alpha= 0.75).

Intent to Pursue College Health Science

This was measured with the question: “*I expect to pursue a college education in health science.*” Possible responses on a 7-point semantic differential scale ranged from 1=“*strongly disagree*” to 7=“*strongly agree*”. Correlations with the following variables provided some validation of this variable as an outcome variable: plan to pursue a medical (RN, MD) degree ($r=.77$, $p < .0001$), plan to become a health professional ($r=.81$, $p < .0001$), plan to become a research scientist ($r=.50$, $p < .0001$).

All analyses were conducted using SAS 9.3 and Mplus. Mplus was used to test the structural model for path analysis. The derived path coefficients in path analysis are estimates of the direct effect of an independent variable on a dependent variable while controlling for the shared variances with other independent variables in the equation. The criterion for retaining a path in the model was based on the significance of the path coefficient (ie, $p < .05$). The final model obtains significant standardized path coefficients so that the strength and the direction of the coefficients can be assessed and compared with each other.

In the path analysis, we conducted the model fit tests before testing the path coefficients. Multiple indices were used to test the model fit and they include the following components: (a) the chi-square, where the non-significant chi-square supports the model fit; (b) the Comparative Fit Index (CFI) and the Tucker Lewis Index (TLI) are measures of model fit, where the value of 0.90 or higher is considered acceptable;²⁵ (c) the root mean square error of approximation (RMSEA), with the value of 0.05 or lower indicating a good fit.²⁶

RESULTS

Table 1 presents a summary of the demographic characteristics of the 12th grade sample. The sample was entirely of minority race/ethnicity: 72.4% African American/Black and 20.7% Hispanic/Latino. The majority (73%) of the sample was female. Over three-quarters (76.5%) had received free or reduced-price lunches during high school. About one-third (36.2%) were not born in the United States (US), and more than two-thirds (68.7%) had at least one parent who was born outside the US. Less than one-third (30.2%) of fathers had a college

education, and just over one-third (40.9%) of mothers had a college education. Almost all of the students (94.8%) intended to go to college.

To assess the correlation of the variables in the path analysis model, we calculated the zero-order Pearson correlation coefficients (Table 2). The strongest to weakest correlates of intent to pursue health college-level health science were: Subjective Norm ($r=.58$, $p<.01$), Attitude ($r=.44$, $p<.01$), adult encouragement ($r=.43$, $p<.01$), personal health experiences ($r=.33$, $p<.01$), extra-curricular science activities ($r=.23$, $p<.05$), and Perceived Behavioral Control ($r=.21$, $p<.05$). Science courses were not correlated with intention to pursue health sciences. Three variables (extra-curricular science activities, personal health experiences, and adult encouragement) were correlated with all 3 TPB variables. Science courses were only associated with Perceived Behavioral Control.

The 12th grade path analysis (Figure 2) indicated that Attitude and Subjective Norm, but not Perceived Behavioral Control, predicted intention to pursue college-level health science. Adult encouragement predicted all 3 TPB constructs. Personal health experiences predicted Attitude. Neither science courses nor science activities predicted any of the TPB constructs.

The cross sectional path analysis for the 12th grade (Figure 2) indicated an adequate model fit. The overall model yielded a chi-square of 58.51 ($p<.01$). The chi-square/df ratio was 2.65, meeting model fit criterion. The model produced a CFI of 0.92. The TLI yielded a ratio of 0.91. The RMSEA of 0.045 (90% CI, 0.41–0.49) indicated a small residual.

DISCUSSION

The study sample examined here was 12th graders from a lower income area, and was predominantly African American, female, and from recent immigrant families. In this sample, academic science courses and extra-curricular science activities did not produce pathways to students' pursuit of college health science. Nevertheless, adult encouragement did predict Attitude and Subjective Norm, and Attitude and Subjective Norm did predict intention to pursue college-level health science. Personal health experiences also predicted Attitude providing a second potential pathway to predicting intention to pursue college-level health science. Thus, pathways for motivating minority youth toward the pursuit of college-level health science may be through adult encouragement and personal health experiences.

That adult encouragement may influence Subjective Norm and Attitude, and intention to pursue health science is supported by previous research showing that high school students cited parents and teachers as particularly influential in their pursuit of science.²⁷ As youth in underserved areas may lack encouragement about pursuit of health science careers from their peers, adult encouragement and engendered expectations and attitudes about health science careers may be particular influences on career intentions.²⁷

That personal health experiences may also influence Attitude and intention to pursue health science among high school students is supported by research on the influence of personal health experience on health care professionals. It has been observed that health care professionals who have personally experienced disadvantage are more likely to care for the disadvantaged.^{28,29} In the lower income setting where the study took place, the youth may

encounter health challenges in their social milieu given the disproportionate burden of health disparities in such populations. These experiences may shape their perceptions about health science and influence their intentions. High school students may be provided with personal health experience through volunteer and work experience in health settings,^{27,30,31} formation of health science-minded peer social groups,³² and academic-community partnerships to expose youth to real-life health situations and contexts.³³

It is notable that health science-related courses and extra-curricular activities, and Perceived Behavioral Control were not significant pathways to intention to pursue college health science. High school youth from under-represented backgrounds may not have impactful health science opportunities or perhaps the influence of such opportunities is small compared to other influences. Likewise, for a sense of Perceived Behavioral Control to drive intentions, perhaps youth need to be made more familiar with the challenges of college health science and ways to overcome them or perhaps student perceptions about overcoming challenges are not as motivating as attitude about health science and the expectations of key adults about pursuit of health science. While there may be some academic and extra-curricular high school preparation that would motivate lower income minority youth toward health science, it appears that successful academic and extra-curricular high school science preparation must be intensive, focused on self-efficacy, and targeted to specially selected students.^{34–37} Elucidating the relative influence of intensive versus superficial science training on preparation for college health science is a study of 8310 students in introductory college biology, physics, and chemistry. The study showed that students who had been taught a science topic in-depth for over a month in high school were more prepared than those who had been taught a broad range of topics without great depth on any one topic.³⁸ Such intensive, in-depth science training may be lacking in many underserved neighborhood schools like those in this study, potentially undermining students' motivation to pursue college health science.²⁷

That the sample was almost three-quarters Black, over a third was foreign-born, and over two-thirds had at least one foreign-born parent should be recognized when interpreting this study. The implications of these sample characteristics are, however, difficult to identify due to the diversity of non-United States (US) immigrant family backgrounds and few scientific comparisons clarifying differences in career aspirations between Black students of US native and non-native families. The study schools were in predominantly Black neighborhoods with a high percentage being foreign born; at least 21% in the overall county of the study neighborhoods.³⁹ While the large Black representation is consistent with the area demographics, students from non-native families were over-represented in the study. In 2008, 26% of the study suburban neighborhoods' immigrants were from Africa; with immigrants predominantly from Ethiopia, Ghana, Nigeria, and West Africa.⁴⁰ The experiences, perceptions and needs of Black students from non-native families could be very different from those of native families. The observation that such a large percentage of the student volunteers were from non-native families could mean that these students were in some way unique in the study schools.

There are a large number of potentially unique factors affecting education and career paths of students from immigrant families including family social support, language proficiency,

and legal status.^{41,42} US-born Blacks report more experiences of racism,⁴³ and have less optimism in their ability to achieve the “American dream” than foreign-born Blacks.⁴⁴ Youth from immigrant families may have greater academic motivation due to greater sense of family obligation than youth from US-born families.^{45,46} School success of children in immigrant Black families may be higher than children of US-born blacks, but their relative success appears to be dependent on both the number of immigrant parents (1 versus 2) and on the socioeconomic situation of the parents.⁴⁷ Relative to others of their same socioeconomic background and academic performance, students from immigrant Black families tend to be more highly represented in selective colleges than students from native Black families. This has been attributed to immigrant families having more 2- versus one-parent households along with other factors.⁴⁸ Teacher expectations are lower for Black students with lower versus higher socioeconomic backgrounds, and such lowered expectations may be institutionally reinforced resulting in teachers’ low sense of responsibility for poor Black students’ learning.⁴⁹ Although distinctions in education between students from native and non-native families have been identified, the little available evidence to characterize the distinctions also suggests that the contrasts are hard to stereotype, rapidly evolving, and under-studied.⁵⁰ Generalizations about students from foreign-born versus US-born families may be misleading because of cultural differences among foreign-born immigrants from different places of origin, family structures, and socioeconomic circumstances.⁴⁴

Overall; however, the findings of this study are consistent with what is known about poorer Black students from both US native and non-native families. Poorer Black students may find reliable sources of encouragement for health science from adult guardians, mentors, and role-models rather than academic institutions that lack high commitment to their learning. In addition, personal health-related experiences may influence poorer Black students’ intentions to pursue health science given the heavy and disproportionate burden of disease among poorer Blacks and strong commitment to family well-being, a trait observed to be most strong among students from foreign-born families.

The study has several potential limitations which should be considered when interpreting the results. The youth sample was from high schools in a single county and lower socioeconomic geographic area, predominantly African American, female, and from new immigrant families, and thus results may not generalize to all other minority high school populations. Students were recruited using convenience sampling which likely introduced selection bias toward students thought to be most interested in college and health science. Parental consent was mandatory for study participation and thus students who participated may have had more parental encouragement than other minority youth. Scale measures were based on adaptations of prior measures and although reliable, their validity has not been confirmed. Finally, the path model is cross-sectional so any inferences to causal pathways are hypothetical.

In spite of the limitations, the study has several unique strengths. The sample is understudied, often considered difficult to access for research, and important to the healthcare workforce. The multi-item construct measures have acceptable to excellent reliability and are strongly grounded in established theory. The outcome, intent to pursue

college health science, is not specific to a particular type of health science or health science career which matches high-schoolers' lack of specific knowledge about specific health-related sciences and careers. It is, however, highly correlated with interest in multiple health science careers providing validation that it represents intention to pursue health science.

It was hypothesized that 4 types of exposures (high school science courses, extra-curricular science activities, personal health experiences, and adult encouragement) would be associated with all 3 motivational constructs in the TPB (Attitude, Subjective Norm, and Perceived Behavioral Control), and all 3 TPB constructs would be associated with intention to pursue college health science. The study results suggest that traditional modes of academic influence on pursuit of health science, science courses and extra-curricular science activities, are not associated with lower socioeconomic status minority high school student interest in health science. Rather, having personal health experiences and adults who encourage pursuit of health science is more influential among these youth suggesting personal rather than academic influences are key to the youths' pursuit of health science. Also, the study results suggest that the attitudes and expectations of others, rather than ways of overcoming perceived behavioral challenges, are key to predisposing youth to pursue health science. TPB was developed from the Theory of Reasoned Action (TRA) by adding the motivational construct Perceived Behavioral Control. Attitude and Subject Norm, but not Perceived Behavioral Control, provided motivational pathways to intention in this study. Hence, it could be said that the original TRA, rather than the TPB, is highly relevant to understanding youth health science intentions based on this study.¹⁵

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Figure 1.
Theory of Planned Behavior (TPB) Framework for Increasing Intention to Pursue College Level Health Science

Figure 2. Cross-Sectional Path Model When Students Were Finishing The 12th Grade (N = 116)
 Note: * $p < .05$, ** $p < .01$

Table 1

Characteristics of the path model study sample (N = 116)

	N (%)
Gender	
Male	31 (27.0)
Female	84 (73.0)
Race/Ethnicity	
Hispanic/Latino *	24 (20.7)
Black/African American	84 (72.4)
Native Hawaiian/Pacific Islander	0 (0)
American Indian/Alaska Native	3 (2.6)
Asian	5 (4.3)
White	0(0)
Received Free or Reduced Price Lunch Program in High School	
No	27 (23.5)
Yes	88 (76.5)
Born in the US	
No	42 (36.2)
Yes	74 (63.8)
Both parents born in the US	
No	79 (68.7)
Yes	36 (31.3)
Father's education level	
Below college	56 (48.3)
College or higher	35 (30.2)
Do not know	25 (21.6)
Mother's education level	
Below college	53 (46.1)
College or higher	47 (40.9)
Do not know	15 (13.0)
Intend to go to college**	
Yes	110 (94.8)
No	6 (5.2)
Mean (s.d.)	
Attitude (Range: 1–49; N = 116)	34.6 (7.57)
Subjective Norm (Range: 1–49; N = 116)	15.08 (11.38)

	N (%)
Perceived Behavioral Control (Range: 1–49; N = 116)	33.29 (8.85)
Science courses (Range: 0–12; N = 116)	5.37 (3.40)
Extra-curricular science activities (Range: 0–4; N = 116)	1.83 (1.19)
Personal health experiences (Range: 1–7; N = 116)	4.87 (1.47)
Adult encouragement (Range: 1–7; N = 116)	5.55 (1.24)
Intent to pursue college education in the health sciences (Range: 1–7; N = 116)	4.34 (2.28)

* If self-identified as Hispanic/Latino and another race/ethnicity, subjects were counted as Hispanic/Latino only.

** 4 = “no,” 5 = “yes” on 1–7 scale where 1=strongly disagree and 7=strongly agree.

Table 2Correlation among path model variables at the end of 12th grade

	Intention	Attitude	Norm	PBC	Courses	Activities	Experiences	Support
Intention	1.00	0.44**	0.58**	0.21*	0.13	0.23*	0.33**	0.43**
Attitude		1.00	0.48**	0.49**	0.02	0.29**	0.45**	0.50**
Norm			1.00	0.25**	0.02	0.23*	0.23*	0.36**
PBC				1.00	0.19*	0.19*	0.23*	0.36**
Courses					1.00	0.15	0.06	0.07
Activities						1.00	0.19*	0.30**
Experiences							1.00	0.37**
Support								1.00

* p < .05,

** p < .01

Key:

1. Intent to pursue college-level health science (Intention)
2. Attitude
3. Subjective Norm (Norm)
4. Perceived Behavioral Control (PBC)
5. Science courses (Courses)
6. Extra-curricular science activities (Activities)
7. Personal health experiences (Experiences)
8. Adult encouragement (Support)