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Predictors of Summer Sun Safety Practice Intentions among Rural High School Students

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Abstract

Objective—To investigate the association between theoretically grounded psychosocial motivators and the sun safety practice intentions of rural youth.

Method—A survey was given to 219 members of FFA (Future Farmers of America) at high schools in rural Midwest (average age = 16).

Results—Perceived self-efficacy, peer norms, response efficacy, and susceptibility predicted protective clothing and sunscreen use intentions. Among boys, perceived norms among same sex peers, but among girls, norms among both same and opposite sex peers, were significant.

Conclusions—Self-efficacy should be an important component of sun safety education for rural youth. Gender-specific peer norms should also be addressed.

Keywords

rural; adolescents; sun safety; skin cancer

Introduction

Skin cancer is the most common type of cancer, accounting for almost 50% of cancer cases in the U.S.[1] Pivotal to reducing future rates of skin cancer is promoting sun safety among adolescents because the number of sunburns during adolescence significantly increases the risk of developing melanoma and basal cell carcinoma later in life.[2,3]

The rate of sun protection reported by adolescents is poor. Only about 20% of adolescents wear protective clothing and only about 30% apply sunscreen consistently when out in the sun.[4] Consequently, over 75% of adolescents have experienced at least one sun burn. About 35% of adolescents have experienced 3 or more sunburns and over 10% have experienced more than 5 sunburns in a one year period.[5]

Fewer adolescents practice sun safety than younger children or adults.[6] Age-specific studies of the prevalence of sun safety behavior suggest that the function of behavior and age may be characterized as U-shaped. The influence of parents or guardians diminishes as individuals move from childhood through adolescence. During this transition, adolescents seek to establish their independence from adults, and acquire new beliefs and attitudes from

their peers.[7] Research indicates that during adolescence sun protection attitudes and behaviors decrease, while positive attitudes toward sun tanning increase.[8,9]

Previous research for promoting sun safety focused on adults and children, and few studies focused on adolescents, especially those who are at high schools.[10] Therefore, existing knowledge is less than sufficient with respect to psychosocial factors that may motivate or hinder high school adolescents' intentions to practice sun safety.

Examination of the psychosocial factors is especially important for adolescents of farm families. These adolescents may be at higher risk of skin cancer because they tend to spend lengthy time out in the sun to carry out their farming responsibilities.[11] Only a limited number of studies investigated the sun safety practices among residents of rural areas, and these studies focused on rural children[11] and adults.[12,13] Few, if any, studies investigated the sun safety practice of rural adolescents.

Thus, the purpose of the present study is to investigate the psychosocial factors predicting the intentions to practice sun safety among FFA (Future Farmers of America) member students at high schools in rural Midwestern U.S. Because the FFA agricultural education program is designed to inform and equip high school students with knowledge and skills necessary for a variety of professions related to agriculture, it offers an excellent avenue to deliver a skin cancer risk prevention education curriculum. Findings of this study can help the design of the content components of an effective skin cancer risk prevention education curriculum for rural adolescents.

Conceptual Framework

Developing effective cancer education programs involves integrating components of theories that have been proven for their explanatory and predictive power through past research.[14] Previous theory and research suggests that 4 major psychosocial beliefs may be important to predicting summer sun protection intentions of adolescents: perceived susceptibility, self-efficacy, response efficacy, and perceived peer norms.[15-19] These concepts comprise the framework of this study, and each concept is discussed below.

Perceived susceptibility

Perceived susceptibility refers to personal beliefs about the probability of experiencing harm.[15] According to protection motivation theory, perceived susceptibility provides a motivation to perform a recommended health behavior.[15] This prediction has been supported by previous research. For example, Mermelstein and Riesenberg found that perceived susceptibility was a significant predictor of suburban Chicago area high school students' intentions to use sunscreen.[20] Similarly, Jackson and Aiken found that perceived susceptibility was a significant predictor of self-reported use of sun protection among college women.[21]

Concomitantly, protection motivation theory suggests that perceived susceptibility alone may not be sufficient to produce protective actions. Instead, beliefs of efficacy should accompany the beliefs of susceptibility.[15] Specifically, while perceived susceptibility provides a motivation to perform, perceived efficacy provides the ability to perform a recommended health behavior.[15]

Perceived self-efficacy

Two major types of efficacy are relevant to skin cancer risk prevention behavior: self-efficacy and response efficacy. Self efficacy refers to personal beliefs about one's ability to carry out a recommended behavior to control a threat.[16] The significance of self-efficacy in

people's enactment of health behavior is well documented across a wide range of health behavior domains.[16] In the domain of skin cancer prevention behavior, Hedecker et al found that self-efficacy is a significant factor predicting the self-reported sun protective actions of suburban Chicago high school students.[22] Similarly, Jackson and Aiken found that self-efficacy predicted sunscreen use intentions of college women.[21] Self-efficacy is likely to be also relevant to the practice of sun safety among rural adolescents.

Perceived response efficacy

Response efficacy refers to personal beliefs about the effectiveness of a recommended behavior in controlling a threat.[16] Although research shows that self-efficacy is a stronger influence on behavioral intentions than response efficacy,[23] it is important to consider both types of efficacy in cancer prevention efforts. Self-efficacy beliefs in ineffective methods of sun protection, for example, are unlikely to result in the reduction of one's risk of skin cancer.[16]

Understanding response efficacy beliefs can be especially important for promoting protective clothing use as a means to sun protection. The International Agency for Research on Cancer of the World Health Organization recommended avoiding the sun and wearing protective clothing as the primary means, with sunscreen use as an adjunct, to protect against melanoma and basal cell carcinoma.[24,25] This recent emphasis on protective clothing use, over and above sunscreen use, may require adolescents' understanding of and confidence in the effectiveness of protective clothing use as a means to sun protection.

Perceived peer norms

Theories of behavior change predict that individuals' health behavior is influenced by not only internal personal beliefs such as perceived susceptibility and perceived self- and response efficacy, but also social environmental beliefs such as perceived peer norms.[17-19] Norms are of 2 types.[19] Descriptive norms refer to the perceived prevalence of a certain behavior in a social reference group (eg, peers), whereas injunctive norms refer to perceived approval or disapproval of a certain behavior by a social reference group.[19]

Importantly, recent research shows that the perceived prevalence of health behavior (ie, descriptive norms) can influence youth's willingness to perform the health behavior. For example, some alcohol abuse prevention interventions showed that informing college students of the prevalence of peers who drink moderately were successful in reducing the incidences of binge drinking.[26]

In the case of sun protection, for example, perceived peer norms may include the estimated number of friends who use sunscreen when out in the sun during summer. The larger the estimated number of friends who use sunscreen, the higher the perceived need to conform to the norm.[19] Perceived prevalence of a certain behavior motivates individuals to adopt the behavior, because prevalence implies usefulness of the behavior in managing social life.[19]

Initial evidence of effectiveness of normative component of skin cancer prevention education was recently reported. Specifically, Mahler and colleagues found that the effectiveness of their appearance-based skin cancer prevention intervention for college students in California was enhanced with an addition of social norms information.[27] Skin cancer prevention education for adolescents may need to address the role of perceived peer norms as well.

Importantly, among peers, there are same and opposite sex peers, and their influence on high school aged adolescents' decisions to use protective clothing (ie, long sleeve shirts, long pants) and sunscreen use may be different. Assessing and understanding the potentially

differential influence of same and opposite sex peer norms on adolescents' sun safety practice intentions may enhance future sun protection education efforts for this population.

Existing literature is not consistent whether same or opposite sex peers norms are more important for adolescents' behavior, however. Some studies suggest that perceived norms among opposite rather than same sex peers influence adolescents' behavior.[28,29] Others, however, suggest that same rather than opposite sex peer norms may exert a greater influence on adolescents' decisions to engage or not to engage in a behavior.[30-32] Collectively, these different perspectives on gender norms' influences indicate that more research is warranted.

Overall, the goal of this study is to investigate how theoretically grounded psychosocial factors predict rural high school FFA students' intentions to practice summer sun safety. On the basis of prior theory and research, we hypothesize that perceived susceptibility, self-efficacy, response-efficacy, and gender norms will be significantly associated with the intentions. Because the current literature offers mixed perspectives on the influence of gender norms, we will explore whether same or opposite sex peer norms are more strongly associated with adolescents' sun protection intentions. Because the sun protection methods of protective clothing use and sunscreen use may have different ramifications on gender role beliefs and values of adolescents,[5] we will examine the contributions of the theoretical predictors separately for boys and girls.

METHODS

Overview, Participants, and Procedure

Baseline data collected from 219 members of FFA at high schools in the rural Midwest were analyzed. Participants were recruited for a brief intervention designed to evaluate the effectiveness of different types of message strategies for promoting sun protection. Participants were recruited from 8 rural high schools in Indiana.

Participants' ages ranged from 13 to 18. The typical participant was about 16 years old (M = 15.61, SD = 1.34). There were more male (53.0%) than female participants. The vast majority, 95.5%, of the sample was White.

Students received a packet comprising the principal investigator's cover letter, parental consent form, and adolescent assent form 3 weeks prior to the study. Both the parental and adolescent assent forms provided a detailed description of the study. Only the students who turned in both the parental consent and adolescent consent forms by the study date participated in the study. Each participant received $5 as compensation for their time.

The study was done during activities hours in classroom settings. A trained graduate research assistant introduced the study as an effort to understand teenagers' sun protection practices. The introduction also emphasized the importance of honest responses and anonymous nature of the study. Students completed a paper and pencil, self-administered questionnaire. The investigators' University Institutional Review Board approved this study.

Measures

Perceived susceptibility, self-efficacy, and response-efficacy were assessed with the validated risk behavior diagnosis scale.[33] Perceived peer norms were assessed with Fishbein and colleagues' scale,[34] which demonstrated good validity in prior research.[37] Unless otherwise noted, the response scale ranged from 1 "strongly disagree" to 7 "strongly agree."

Perceived susceptibility was assessed with the following 2 items: "I am worried about developing skin cancer later in life" and "The possibility of developing skin cancer worries me" (α = .90).

Perceived self-efficacy for sun safety behaviors was assessed with the following items: "It is easy for me to wear sunscreen when in the sun," "It is easy for me to wear a long sleeve shirt when in the sun," and "It is easy for me to wear long pants when in the sun."

Perceived response efficacy for sun safety behaviors was assessed with the following 3 items: "Wearing sunscreen when in the sun is effective in preventing skin cancer," "Wearing a long sleeve shirt when in the sun is effective in preventing skin cancer," and "Wearing long pants when in the sun is effective in preventing skin cancer."

Perceived peer norms—Participants were asked to estimate the perceived prevalence of the use of each of the sun safety behaviors of sunscreen use, long sleeve shirts use, and long pants use among their male and female peers: "How many of your male friends wear [sunscreen] when in the sun?" and "how many of your female friends wear [sunscreen] when in the sun?" The response scale ranged from 1 "none of them" to 5 "all of them."

Covariates—Perceived benefits of a tan and sunburn during the preceding summer (0 = no, 1 = yes) were assesses as covariates. Perceived benefits of a tan were measured with Cokkinide et al's 3-item scale (eg, "I think I look better with a tan;" α = .92).[4]

Analysis—Multiple regression analyses were performed for each of the sub-samples of boys and girls. Each of the intention to use sunscreen, long sleeve shirts, and long pants was regressed onto the above-noted covariates and the theoretical variables of perceived vulnerability, self-efficacy, response efficacy, and peer norms. Table 1 presents the results.

RESULTS

Predictors of Sunscreen Use Intentions

Among boys, perceived self-efficacy in wearing sunscreen when in the sun (β=.39, P<.001), perceived prevalence of sunscreen use among male peers (β=.26, P=.007), and perceived risk of skin cancer (β=.18, P=.02) were significantly associated with intentions to use sunscreen when in the sun in the summer.

Among girls, perceived self efficacy in wearing sunscreen when in the sun (β=.42, P<.001) and perceived prevalence of sunscreen use among male peers (β=.20, P=.045) showed a significant positive association with intentions to use sunscreen when in the sun in the summer. Perceived benefits of a tan showed a significant negative association (β= −.17, P=.04), whereas having sunburned last summer showed a significant positive association, with girls' intentions to use sunscreen when in the sun during summer (β=.16, P=.05).

Predictors of Long Sleeve Shirts Use Intentions

Among boys, perceived self-efficacy of wearing long sleeve shirts when in the sun (β=.30, P=.002) and perceived prevalence of long sleeve shirts use among male peers (β=.22, P=.027) were significantly associated with intentions to use long sleeve shirts in the summer.

Among girls, perceived self-efficacy in wearing long sleeve shirts (β=.42, P<.001), perceived response efficacy of long sleeve shirts (β=.26, P=.002), and perceived prevalence of long sleeve shirts wearing among female peers (β=.22, P=.01) were significantly associated with intentions to use long sleeve shirts in summer. Perceived benefits of having

a tan showed a significant negative association with girls' intentions to use long sleeve shirts (β=−.26, P=.002).

Predictors of Long Pants Use Intentions

Among boys, perceived self-efficacy of wearing long pants when in the sun (β=.50, P<.001) and perceived prevalence of long pants use among male peers (β=.37, P<.001) were significantly associated with intentions to use long pants in the summer.

Among girls, perceived self-efficacy of wearing long pants when in the sun (β=.41, P<.001), perceived prevalence of long pants use among male peers (β=.28, P=.002), and perceived response efficacy of long pants use (β=.17, P=.026) were positively associated with intentions to use long pants in the summer. Perceived benefits of having a tan showed a significant negative association with girls' intentions to use long pants (β=−.20, P=.01).

DISCUSSION

Promoting sun protection among adolescents is important to preventing future rates of skin cancer, and designing and delivering effective skin cancer education for adolescents living and working in rural America is even more important. This study examined the psychosocial predictors of rural high school FFA students' summer sun protection intentions. Specifically, this study focused on the theoretically grounded variables of perceived susceptibility, self-efficacy, response efficacy, and peer norms.

Generally, the results show that adolescents' intentions to use sun protection are predicted by factors operating in both personal and social domains. The results suggest that future skin cancer education efforts for this population should address their perceived self-efficacy and gender-specific peer norms, as well as perceived response-efficacy and susceptibility.

Specifically, perceived self-efficacy was a significant predictor of the intentions to use each of the 3 sun protection methods of sunscreen, long sleeve shirts, and long pants among both adolescent boys and girls. Therefore, addressing self-efficacy should be an important content component of future sun safety education efforts for adolescents. Providing information and skills that address personal and social barriers to practicing sun safety may be an effective means to improving self-efficacy.[35]

Perceived peer norms emerged as a significant predictor of both adolescent boys' and girls' intentions to use sunscreen, long sleeve shirts, and long pants during summer. These results show that future sun safety education efforts for adolescents should address not only personal beliefs such as self-efficacy, but also social beliefs such as perceived peer norms.

Furthermore, the results suggest that addressing gender-specific peer norms may need to be an important component of sun safety education for adolescents. The findings show that gender-specific peer norms are differentially associated with boys' and girls' sun safety intentions. On one hand, among boys, perceived same sex peer norms (ie, male peer norms) predicted their intentions to use sunscreen, long sleeve shirts, and long pants. The higher the boys' estimation of the perceived prevalence of sun protection use among their male peers, the stronger their intentions to use the sun protection. On the other hand, among girls, perceived opposite sex peer norms (ie, male peer norms), as well as perceived same sex peer norms (ie, female peer norms), were significant. Specifically, perceived male peer norms predicted girls' sunscreen use and long pants use intentions, whereas perceived female peer norms predicted girls' long sleeve shirts use intentions.

These results suggest that addressing gender-specific peer norms may need to be an important component of skin cancer education for adolescents. Depending on the gender of the intended audience, the focus of social norms information may need to be different. Interventions to promote sun protection among boys would need to emphasize the prevalence of sun protection use among other boys, while interventions for girls would need to emphasize the prevalence of sun protection use among both other girls and boys.

Other findings also suggest that understanding gender differences may be important for sun safety education for high school aged adolescents. For example, perceived susceptibility to skin cancer predicted boys' intentions to use sunscreen, but not girls'. It might be possible girls are more sensitive to the more proximal consequences of sun damage such as dry, wrinkled skin. For example, Hillhouse and Turrisi found that appearance concern is a significant concern of college women.[36] More research is needed to ascertain relevant consequences of sun damage to adolescent boys and girls.

Perceived response efficacy was a significant predictor of girls' intentions to use long sleeve shirts and long pants as means of sun protection during summer. It is possible that more boys than girls wear long sleeve shirts and long pants routinely, and the results suggest that one way of promoting protective clothing use among girls may be to inform them about the effectiveness of protective clothing as a means to sun protection. Doing so would be important, considering the recent emphasis on protective clothing use as a primary means of sun protection.[20]

Perceived tan benefits were a significant covariate negatively predicting girls' intentions to use sun protection, including sunscreen, long sleeve shirts, and long pants. In comparison, perceived tan benefits were not related to boys' intentions to use sun protection. Addressing the tan benefit perception among girls would be an important task for future sun safety education efforts for this population. Furthermore, research efforts may need to be directed to identifying the sources of such beliefs.

Finally, it is also noticeable that girls', but not boys', experience of one or more sunburns during the preceding summer positively predicted intentions to use sunscreen in the next summer. Effective skin cancer education is urgently needed to convince both boys and girls about the harmful effects of sunburns.

Limitations

There are some limitations to this study. First, although this study involved the at-risk population of high school FFA students in rural Midwest, the sample size was relatively small. Gaining a more comprehensive understanding of the sun protection practices of this vulnerable population requires large scale studies.

Second, this study relied on a cross-sectional sample. The use of longitudinal cohort or panel sample would be desirable in future research. The use of a longitudinal design will allow the examination of the association between the theoretical predictors and the actual practices of summer sun protection in this population.

Finally, we used single item measures to assess perceived self-efficacy and perceived norms. Although the items are taken from scales that demonstrated good validity in previous research, the use of multiple item measures would have been desirable.

Only a limited number of studies examined rural residents' sun safety practices, and even fewer studies investigated rural adolescents' beliefs and behaviors relevant to sun safety. Understanding the beliefs underlying rural adolescents' sun safety practice intentions is

necessary to developing effective sun safety education programs for this population. Findings of this study show that sun safety education efforts for rural high school adolescents should address their perceived self-efficacy and gender-specific peer norms, as well as perceived response efficacy and susceptibility.

Concluding Comments

Only a limited number of previous studies examined rural residents' sun protection behavior, and even fewer studies investigated rural adolescents' beliefs and behaviors relevant to sun protection. Understanding the contributions of theoretically grounded psychosocial variables toward the behavioral intentions of rural adolescents is important to the design of effective skin cancer education programs for this population.

Findings of this study suggest that skin cancer education efforts for rural high school FFA students should address their perceived self-efficacy and peer norms, as well as perceived response efficacy and susceptibility. Furthermore, the results show that gender difference should be recognized in the design of skin cancer education programs for this population.

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Table 1

Predictors of Sun Protection Use Intentions among Rural High School FFA Students

	Sunscreen		Long sleeve shirts		Long pants	
	Boys	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**
Perceived tan benefits	−.04	−.17*	−.15	−.26*	−.02	−.20*
Sunburn during last summer	−.11	.16*	−.06	−.08	.02	.00
Perceived risk of skin cancer	.18*	.09	.10	−.03	.02	−.14
Perceived response efficacy	.07	.04	−.06	.26*	.00	.17*
Perceived self-efficacy	.39***	.42***	.30***	.42***	.50***	.41***
Perceived male peer norms	.26**	.20*	.22*	−.13	.37***	.28**
Perceived female peer norms	−.04	.08	.11	.22*	.09	.00
Adjusted R^2	.36	.41	.29	.43	.54	.51
R^2	.40	.45	.33	.48	.57	.55

Note. Numbers are standardized regression coefficients.

* P≤.05,

** P<.01,

*** P<.001