PROTOCOL TITLE: Deliberate ultraviolet light exposure to get a tan by young adult sexual minority males

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VERSION DATE:
February 6, 2019

STUDY SUMMARY:

The purpose of this study is to: a) identify enablers and barriers to deliberate ultraviolet light exposure by young sexual minority men (SMM), and b) quantify the extent of their deliberate ultraviolet light exposure.

OBJECTIVES:

Aim 1: To develop survey items to assess tanning attitudes and behaviors

Nine survey items used by the PI in previous deliberate tanning research were adapted with the expert consensus of members of Northwestern's Institute for Sexual and Gender Minority Health and Wellbeing. Discussions with the PI, research personnel and members of the institute developed the hypothesis that in addition to the previously reported appearance motivations young SMM may be engaging in tanning (indoors or outdoors) as a social activity. A tenth survey item was developed to assess deliberate tanning as a social activity.

Aim 2: Analyze the tanning attitudes and behavior data acquired in an online survey of young adult sexual minority males, who regularly participate in the RADAR study.

RADAR is a longitudinal study with cohorts from the greater Chicago region recruited between 2008 and 2015. The 10 survey items about tanning attitudes and behaviors were added to the online survey that examines SMMs' behavior in the prior 6 months.

Knowledge gained from this study may be help reduce deliberate ultraviolet light exposure and the risk of developing melanoma among SMM.

BACKGROUND:

Sexual minority males, who have one of the highest known estimated lifetime skin cancer prevalence, are an at-risk group for developing skin cancer. The estimated lifetime skin cancer prevalence for SMM is 8.1%, compared to 6.7% for heterosexual men. (Singer 2020) Elevated rates of skin cancer among SMM are thought to be driven by excess indoor tanning by young men, who are motivated by body image, appearance concerns, and affect regulation. (Blashill 2017, Mansh 2015, Morrison 2019) In the past nationally representative samples of US adolescents found that SMM were significantly more likely than heterosexual men to have ever engaged in indoor tanning by 16 years of age (27.0% vs 8.6%; odds ratio 3.9; 95% CI, 1.6-9,8) (Blashill 2014,2017).

In national self-reported surveys of adolescent men, who participated in indoor tanning, were more frequent outdoor sunbathers and substance users, such as tobacco or alcohol abuse and marijuana use (Demko 2003, Miyamoto 2012, Miller 2018). Historically, adolescents and young adults living in the American Midwest (adjusted odds ratio 2.38;95% confidence interval 1.53-3.68) have high rates of indoor tanning because extremes in the availability of natural light appear to send intentional tanners indoors. (Demko 2003) The Midwest has the highest proportion of gyms with tanning beds. (Pagoto 2019) Even in regions of the US with more available natural sunlight than the Midwest, 25% of young adult (AYA) males in a college in Alabama concurrently engaged in both types of tanning, indoor and outdoor. (Daniel 2018) Excessive tanning may be a manifestation of tanning addiction (Mosher 2010,Miller 2018) Addictive tanning may have a physiological basis, as exposure to ultraviolet (UV) light

stimulates the production of beta-endorphin, an endogenous opioid peptide with mood-elevating effects. (Kourosh 2010)

The decline in indoor tanning among US adults from 2007-2018 is attributed to indoor tanning youth access legislation. (Bowers 2020). It is possible that the 2012 Chicago and 2013 Illinois law banning indoor tanning for teens younger than 18 influenced the tanning habits of young SMM. (banning laws) While SMM may engage in both types of tanning, data on outdoor tanning by SMM are less available than indoor tanning. We will address this gap by including indoor and outdoor tanning questions in the ongoing RADAR survey of Chicago area young adult SMM that previously assessed alcohol, tobacco, and marijuana use.

STUDY ENDPOINTS:
Aim 1: *Primary Outcome:*
Determine the test, re-test reliability of the 10 survey items using the RADAR participants in the deidentified database.

Aim 2: Primary *Outcome:*
Perform analysis of the data acquired in 6 months with the RADAR online survey. The cohort sample will examine demographic characteristics of those who engage in deliberate ultraviolet light exposure and those who do not. The mean and standard deviation of the 10 survey items with Likert scale (1 strongly disagree, 5 strongly agree) will be assessed for those who tan occasionally and those who tan more than 10 times in 6 months.

STUDY INTERVENTIONS:
none

PROCEDURES INVOLVED:
After 500 responses to the online survey are collected, the deidentified data will be analyzed.

DATA AND SPECIMEN BANKING:
See Data Management. Specimens will not be banked.

SHARING RESULTS WITH PARTICIPANTS:
Since this is a deidentified database, the results of the analysis cannot be shared with the participants.

STUDY TIMELINES:
Reliability test (test, re-test performed after 2 weeks) will be performed in the summer of 2019. Participants will complete one online survey in the 6-month period from Sept 2019-Feb 2020.

INCLUSION AND EXCLUSION CRITERIA:
Inclusion Criteria:
- Young adult SMM (age 18-39)
- Able to read English

- Have internet access
- Willing to complete the online survey

Exclusion criteria
- None

VULNERABLE POPULATIONS:
This study will not include the participation of vulnerable populations

PARTICIPANT POPULATIONS:
500-600 young SMM, who regularly participate in the RADAR study

RECRUITMENT METHODS:
Participants are not recruited for this study. This is a secondary analysis of an existing deidentified database.

COMPENSATION FOR PARTICIPATION IN RESEARCH ACTIVITIES:
Research subjects will not be compensated.

RISKS TO PARTICIPANTS:
The potential risks to participants are expected to be minimal if they occur.

Participants may enhance their awareness of their risk of developing skin cancer.

POTENTIAL BENEFITS TO PARTICIPANTS:
Because of the potential for the survey to enhance awareness of the importance of sun protection, participants may choose to use sun protection. We feel that the potential benefits to the subject outweigh the risk of potential enhanced anxiety in discovering that they are at risk to develop a skin cancer.

DATA MANAGEMENT AND CONFIDENTIALITY:
Data Management and Quality Control
Data will be collected via the RADAR study. The deidentified data for this deliberate ultraviolet light exposure will be exported in an Excel file.

Analysis
Aim 1. The reliability of the survey items
For test-retest reliability of the 10 items, 50 participants would allow a two-category κ to be estimated to within ±0.15 using 95% confidence intervals assuming that Cronbach's alpha values were 0.6 or higher. The intra class correlations will be calculated using ANOVA and he accepted level of test/ re-test reliability will be 0.75-0.80.

Aim 2. Analysis of survey data
The demographic characteristics of the population will be compared for never purposely tan vs ever purposely tan with χ^2 tests. The primary analysis will be analysis of variance (ANOVA) for the mean Likert scale values of the 10 self-reported survey items. Multiple

logistic regression will be used to determine the odds ratio (OR) and independence of predictors of deliberate ultraviolet light exposure to get a tan.

PROVISIONS TO PROTECT THE PRIVACY INTERESTS OF PARTICIPANTS:
This research includes provisions for protecting the privacy of research subjects. Study interactions will take place online via the RADAR study. The research team will be permitted to access study-related, subject-reported information as deidentified data. All data based on the deliberate ultraviolet light exposure research will be reported in aggregate form from the RADAR study to the PI. No individual respondents will be identified.

Only approved research personnel will have access to the stored data. The PI is ultimately responsible for the receipt and transmission of the data.

ECONOMIC BURDEN TO PARTICIPANTS:
Taking part in this research study will not lead to any costs for subjects.

CONSENT PROCESS:
Consent is not required.

PROTECTED HEALTH INFORMATION:
This research study does not involve the use of Protected Health Information.

MULTI-SITE RESEARCH:
NA

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