

## **A Cross-Sectional Study of Behaviors Towards Sun Protection among Filipino using Filipino-Translated Version of Readiness to Alter Sun-Protective Behavior Questionnaire (RASP-B)**

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### **Abstract:**

**Background** From 2011 to 2014, there were 866 cases of non-melanoma skin cancer and 107 cases of melanoma skin cancer that had been documented by the Philippines Dermatological Society. Despite its low incidence, the disease is fatal yet addressable by applying sun-protective behaviors.

**Objective** To determine the behaviors towards Sun Protection among patients using Readiness to Alter Sun-Protective Behaviour Questionnaire (RASP-B) in the Department of Dermatology in Ospital ng Maynila Medical Center.

**Methods** A cross sectional study, was conducted among Filipino adult patients consulting at the Department of Dermatology of Ospital ng Maynila Medical Center Outpatient Department. Readiness to alter sun-protective behavior (RASP-B), a 12-item questionnaire originally developed by Borschmann, was translated into Filipino language (Tagalog) and validated with Cronbach's Alpha for use in the study.

**Results** A total of 278 respondents participated in the study. Majority of the patients were already in the action state with a total of 221 patients (79.50%). There were more males in the precontemplation

(9.52%) and action state (80%), there were more females in the contemplation state (15.61%). Sex, civil status, and body mass index were found to be not associated with the state of change of the participants.

**Conclusions** The feasibility and validity of using a translated version of the RASP-B questionnaire in Filipino language to determine the

readiness to change sun-protective behaviors among Filipino adult patients was assessed in this study. Findings revealed that a majority of the respondents were already in the action stage and only a few were still on the precontemplation stage, which are findings that are far from what is expected.

**Keywords:** Sun Protection Behaviors, Readiness to alter sun-protective behavior

## Introduction

Skin cancer is an abnormal growth of skin cells. It most often develops on areas of the skin exposed to the sun light. Skin cancer affects people of all colors and races, although those with light skin who sunburn easily have a higher risk.<sup>1</sup>

The escalation in the incidence of skin cancer over the past decades is strongly related to outdoor activities and recreational exposure. Overexposure to Ultraviolet light plays a major role as the underlying cause. As ozone levels are depleted, the atmosphere loses more and more of its protective filter function and more solar UV radiation reaches the Earth's surface. It is estimated that a 10 percent decrease in ozone levels will result in an additional 300,000 non-melanoma and 4,500 melanoma skin cancer cases.<sup>2</sup>

According to WHO, the incidence of skin cancer, both melanoma and non-melanoma are rising worldwide. Current estimates are that one in five people will develop skin cancer in their lifetime. It is estimated that approximately 9,500 people are diagnosed with skin cancer every day. Research estimates that nonmelanoma skin cancer, including basal cell carcinoma and squamous cell carcinoma, affects more than 3 million annually. In the Philippines,

the annual mortality rate per 100,000 have been affected by malignant skin melanoma since 1990, an average of 4.2% a year. In 2013, the peak mortality rate for women was higher than that of men which was 5.6 per 100,000 men.<sup>2</sup> There were 866 cases of non-melanoma skin cancer and 107 cases of melanoma skin cancer recorded from 2011-2014 in the Philippines Dermatological Society Health Information System.<sup>3</sup>

Host factors that confer an increased risk include skin type (Fitzpatrick skin types I and II at increased risk), number of melanocytic nevi, presence of dysplastic nevi, and skin cancer in a first-degree relative. Although most of the population of the Philippines have Fitzpatrick skin types III or IV, they may also have risks of both sunburn and skin cancer.

It has been suggested that around 80% of skin cancer cases are preventable with the implementation of Sun protection measures and appropriate behaviors. Sun-protection behavior and attitude begin at a young age; therefore, it is important to heighten the awareness in adolescents. Since children and adolescents are an important target group for skin cancer prevention, developing comprehensive programs including physical, social, and

organizational environments that promote UVR protection. Educating young people about Sun safety is strongly recommended.<sup>4</sup> Sun protection, including wearing protective clothing, staying in the shade, avoiding the sun in the middle of the day, and regularly applying sunscreen when outdoors are therefore important public health messages for skin cancer prevention. Sunscreen is a well-documented method of preventing skin cancer. It has been reported to reduce the carcinogenic effects of sunlight on human skin by reducing the amount of UV radiation that can penetrate the skin by reflecting, absorbing, or dispersing sunlight. As a result, applying sunscreen can protect against sunlight-associated damages. The public health care providers should be educated about the effects of long-time sunlight exposure and the advantages of sun protection.<sup>11</sup>

Education is important to reflect advances in knowledge regarding protection against the potentially harmful effects of the sun so that changes in behavior patterns are produced. Education is the key in raising awareness. Studies have been carried out in many countries to determine awareness levels of the effects of the sun, of skin cancer and of behavior regarding sun protection,

usually with the intention of creating effective health campaigns to prevent skin cancer. However, there is no study using RASP-B reported in the Philippines. Hence, this study aims to determine the behaviors towards Sun Protection among patients seen in the Department of Dermatology Ospital ng Maynila Medical Center.

## **Material and Methods**

### ***Study Design***

A cross sectional study was employed for this study.

### ***Study Population***

This study was done among Filipino adults who consulted at Ospital ng Maynila Medical Center Outpatient Department. The age range was at least 18 to 35 years old. This was a group of individuals likely to engage in risky sun exposure behaviors and therefore a particularly relevant group to examine.<sup>5-6</sup> The exclusion criteria include subjects who were unable to understand either Filipino and/or English and unwilling to participate in the study.

### ***Sample size Estimation***

Based on the census of Ospital ng Maynila Medical Center, Metro Manila in 2018, there were a total of 13200 patients who consulted in the Department of Dermatology. Epi Info 7 software, the minimum sample size

was computed using 50% expected frequency and 95% confidence level. A minimum sample size of 373 patients will be included in the study.

### **Research Instrument**

RASP-B contains 12 items and is designed to assess which stage of change respondents are regarding sun protective behavior. Four items refer to each of the precontemplation, contemplation and active stages of the transtheoretical model of behavior. Respondents will be asked to endorse one of 5 options ranging from “strongly agree” to “strongly disagree”. To calculate these stage scores, responses to each stage of change item were scored as follows: “-2 = Strongly disagree”, “-1 = Disagree”, “0 = Neither agree nor disagree”, “+1 = Agree”, and “+2 = Strongly agree”. There were four statements corresponding to each stage and therefore the total score for each stage ranged from -8 to +8. One participant obtained a score of zero for each of the three stages (by endorsing “0 = Neither agree nor disagree” for all 12 of the stages of change items in the questionnaire) and was consequently not assigned to any of the three stages. (See **Table 1**)

**Table 1 RASP-B**

RASP-B Items	
1	I do not think I spend too much time exposed to the sun. (P)
2	I am trying to spend less time in the sun that I used to. (A)
3	I enjoy spending time in the sun, but sometimes I spend too much time in the sun (C)
4	Sometimes I think I should spend less time in the sun. (C)
5	It's a waste of time thinking about how much time I spend in the sun. (P)
6	I have just recently changed my sun exposure habits. (A)
7	Anyone can talk about wanting to do something about reducing their sun exposure, but I am actually doing something about it. (A)
8	I am at the stage where I should think about spending less time in the sun. (C)
9	The amount of time I spend in the sun is a problem sometimes. (C)
10	There is no need for me to think about changing my sun exposure habits. (P)
11	I am actually changing my sun exposure habits right now. (A)
12	Spending less time in the sun would be pointless for me. (P)

Notes:

P, precontemplation; C, contemplation; A, action.

Permission to translate and to use RASP-B, a 12-item questionnaire, was sought and obtained from Borschmann et. al. The questionnaire was translated into Filipino by a native Filipino translator from the Sentro ng Wikang Filipino. The translated version, which was the first intermediary version of the questionnaire, was pre-tested and evaluated for internal consistency. The questionnaire has Cronbach's alpha of 0.6283.

### Statistical Analysis

Descriptive statistics of the demographic profile and behavior will be determined. For categorical variables, frequency and percentage will be used while for continuous variables, mean, standard deviation, median and mode will be determined. All analyses will be conducted using SPSS 20 for Windows.

### Ethical Consideration

Informed consent will be given prior to administration of the questionnaire. RASP-B can be self-administered in approximately 10-15 minutes.

### Results

There were 278 adult Filipinos included in the study. The age of the patients ranged from 18 to 35 years old. The mean age was 25.29 ( $\pm 4.79$ )

years old, while the median and the mode were 25 and 20 years old. Majority of the patients were female (62.2%) and were single (87.1%) (**Table 2**).

Table 2 Demographic Profile of Patients

Characteristics		
Age in years old		
Mean Age ( $\pm$ SD)	25.29 ( $\pm 4.79$ )	
Median Age	25	
Mode	20	
Sex	No.	%
Female	173	62.2
Male	105	37.8
Marital Status		
Married	36	13.0
Single	242	87.0

The mean height of the patients was 162.09 ( $\pm 6.82$ ), while the mean weight was 58.52 ( $\pm 10.36$ ). More than half of the patients had normal BMI. A little less than one-fourth were overweight. Only a few were obese.

**Table 3 Anthropometric measurements of the patients (N=278)**

Characteristics		
Height in centimeter		
Mean ( $\pm$ SD)	162.08 ( $\pm$ 6.82)	
Median	162.00	
Mode	160.00	
Weight in kg		
Mean ( $\pm$ SD)	58.53 ( $\pm$ 10.37)	
Median	57.00	
Mode	55.00	
Body Mass Index ( $\text{kg}/\text{m}^2$ )	No.	%
Underweight (<18.55)	18	6.47
Normal (18.5-22.9)	168	60.43
Overweight (23.0-24.9)	63	22.66
Pre-obese (25-29.9)	22	7.91
Obese ( $\geq$ 30)	7	2.52

**Table 4 Distribution of patients based on their reason for consultation (N=278)**

Reason for consultation	No.	%
Acne Scar	73	26.3
Acne Vulgaris	90	32.4
Alopecia Areata	1	.4
Arthropod Bite	9	3.2
Hypersensitivity		
Atopic Dermatitis	5	1.8
compound Nevus	1	.4
Compound Nevus	6	2.2
Contact Dermatitis	4	1.4
Dyshidrotic eczema	4	1.4
Ephelides	11	4.0
Folliculitis	3	1.1
Keratosis Pilaris	3	1.1
Melasma	1	.4
Milia	4	1.4

Nummular Eczema	3	1.1
Pityriasis Rosea	4	1.4
Prurigo Nodularis	1	.4
Psoriasis Vulgaris	4	1.4
Pityriasis Rosea	1	.4
Scabies Infestation	4	1.4
Seborrheic Dermatitis	10	3.6
Telogen effluvium	3	1.1
Tinea Cruris	1	.4
Tinea Versicolor	5	1.8
Verruca Plana	19	6.8
Verruca Vulgaris	8	2.9
Family History		
Asthma	3	1.1
Cancer	1	.4
Diabetes	12	4.3
Hypertension	39	14.0
Hypertension, Atopic Dermatitis	1	.4
Hypertension, Diabetes	18	6.5

Fourteen percent had a family history of hypertension. There were 5 (1.8%) patients with asthma.

**Table 5 Clinical history of patients n=278**

Clinical History	No.	%
Asthma	3	1.1
Cancer	1	.4
Diabetes	12	4.3
Hypertension	39	14.0
Hypertension, Atopic Dermatitis	1	.4
Hypertension, Diabetes	18	6.5
Co-morbidities		
Asthma	5	1.8
Atopic Dermatitis	4	1.4
Diabetes	3	1.1
Diabetes, Hypertension	1	.4
Hypertension	3	1.1

The overall total score was 2.02 ( $\pm 5.63$ ) (Table 5). Males have a slightly higher total score than females. However, there were no significant difference observed between the mean scores of each sex (**Table 6**).

The Chi-Square Test of Independence was performed to determine association between each state. Majority of the patients were already in the action state. There were more males in the precontemplation and action state. However, sex was not associated with the state of change of patients ( $p=0.218$ ) (Table 8). In the previous study, gender was significantly associated with reported sunscreen use, staying in the shade, or using an umbrella while in the sun, and wearing sunglasses. Females reported more frequent use for all items and tended to use sunscreen in a more appropriate way than males, but they tended to be more likely to be seeking a tan and increase their ultraviolet exposure.<sup>10</sup> Additionally, gender was significantly associated with wearing shirts with sleeves that cover the shoulders and wearing hats while in the sun, with males reporting more frequent usage for both. The frequency of wearing clothing made with SPF capabilities was found to be similar and infrequent between males and females, with most respondents of

both genders reporting wearing SPF clothing <50% of the time.<sup>9</sup>

Among singles, there were more patients who were already in the action state. Among married, there were more patients who were also in the action state. However, marital status was found to be not associated with the state of change ( $p=1.000$ ) (Table 9). The result however like the previous study, which was not satisfactory, the slight majority of female and married respondents with a higher level of education and economically stable use a higher level of sun protection.<sup>12</sup>

Among those with normal BMI, majority were already in the action state. Among those who do not have normal BMI, majority were also in the action state. There was not significant association found between BMI classification and state of change ( $p=0.544$ ). Several published studies suggest that obesity is a risk factor for the most common types of skin cancer, particularly in people with a history of skin cancer. It appears to be inversely associated with the development of non-melanoma skin cancers therefore it is most likely a surrogate marker for lack of chronic sun exposure<sup>13-14</sup>.



Table 6 Sun-protective behavior of the patients (N=278)

Scores	Mean ± SD	Median	Mode
Total Score	2.02 ± 5.63	2.00	6.00
Precontemplation	-1.08 ± 2.80	-1.00	-2.00
Contemplation	0.64 ± 2.62	1.00	0.00
Action	2.45 ± 2.61	3.00	4.00

Table 7 Mean RASP-B Scores classified according to sex

RASP scores	Female (n=173)		Male (n=105)		p-value
	Mean	SD	Mean	SD	
Total Score	1.99	5.92	2.06	5.13	0.926
Precontemplation	-1.13	2.79	-1.01	2.84	0.737
Contemplation	0.61	2.86	0.69	2.20	0.811
Action	2.50	2.52	2.36	2.75	0.682

Table 8 State of change of patients according to sex (N=278)

State	Female		Male		Total	
	No.	%	No.	%	No.	%
Precontemplation	9	5.20	10	9.52	19	6.83
Contemplation	27	15.61	11	10.48	38	13.67

## Discussion

This study aimed at assessing the feasibility of using a translated version of the RASP-B questionnaire in Filipino language to determine the readiness to change sun-protective behaviors among adult patients who were consulting at the Outpatient Department of the Ospital ng

Action	137	79.19	84	80.00	221	79.50
TOTAL	173	100.00	105	100.00	278	100.00

Table 9 State of change of patients according to marital status (N=278)

State	Single		Married		Total	
	No.	%	No.	%	No.	%
Precontemplation and Contemplation	50	20.66	7	19.44	57	20.50
Action	192	79.34	29	80.56	221	79.50
TOTAL	242	100.00	105	100.00	278	100.00

Table 10 State of change of patients according to BMI classification (N=278)

State	Single		Married		Total	
	No.	%	No.	%	No.	%
Precontemplation and Contemplation	50	20.66	7	19.44	57	20.50
Action	192	79.34	29	80.56	221	79.50
TOTAL	242	100.00	105	100.00	278	100.00

Maynila Medical Center. A previous study had revealed that RASP-B has a three-factor structure that corresponds comparably and psychometrically with the three stages of the transtheoretical model (TTM) of behavior change<sup>5</sup>. TTM is an integrative, biopsychosocial model that conceptualizes the process of intentional behavior change by

integrating key constructs from other theories into a comprehensive theory of change that can be applied across a variety of behaviors, population, and settings <sup>5</sup>. In health psychology, TTM has already been used to explain the changes of behavioral state from acquisition to cessation of smoking behavior and alcohol consumption <sup>4, 6</sup>. The focus of the current study is on sun-protective behavior.

The study that developed and validated the RASP-B questionnaire to assess readiness of behavior was done in Queensland, Australia. Findings of that study highlighted the strength of the questionnaire for its use in the primary health care setting due to its brevity that facilitates expedited completion and its satisfactory psychometric properties <sup>9</sup>. The internal consistency of the RASP-B in assessing each construct of the TTM were 0.67 for the precontemplation stage, 0.72 for the contemplation stage, and 0.76 for the action stage <sup>9</sup>. The Filipino version of the instrument was comparable for having a Cronbach's alpha of 0.63. The pattern of sunscreen use among the respondents aged 18 – 24 years old was also assessed in the previous study. Their findings showed that only one-fourth of the participants usually or always applied sunscreen when spending time outdoors and

half never applied sunscreen when outdoors <sup>9</sup>. Unfortunately, this objective was out of the scope of the current study. Considering that the age of the conveniently sampled population for the current study ranges from 18 to 35 years old, they are apparently likely to spend more time under the sun. Hence, assessing the relationship among time of sun exposure, use of sunscreen, and the readiness to change towards sun-protective behavior may be considered for future research.

Following the procedure of Rollnick et al. in allocating the respondents in each stage of change, findings of the current study showed more favorable results than what is expected.<sup>4</sup> Prochaska made a prediction that for any health-related behavior in any population, approximately 40% will be in the precontemplation stage, 40% in the contemplation stage, and 20% in the action stage <sup>6</sup>. For the previous study that was done in the Philippines, majority respondents were in the precontemplation stage, followed by the action stage. Apparently, this was not the case for the sampled population in the current study. Almost 80% of the respondents in the current study were already in the action stage and about 13% were on the contemplation stage. People at the action stage have made specific

overt modifications in their lifestyles within the past 6 months<sup>5</sup>. People in the contemplation stage, on the other hand, are those who are intending to change in the next 6 months and are aware of the pros and cons of altering their behavior<sup>5</sup>. Only 7% of the respondents were on the precontemplation stage. People at this stage are not intending to take action in the next 6 months maybe due to resistance, misinformation, or lack of awareness about the consequences of altering the behavior<sup>5</sup>. The progression of individuals across the stages of the model during the process of altering health behaviors appears to be sequential from precontemplation to action stage<sup>6</sup>. The implication of this therefore is to implement reinforcing programs that will strengthen fidelity of the participants to the action stage. The challenge for the dermatology clinic is to incorporate in their counseling procedures techniques that will reinforce the healthy behavior.

In the previous study of Borschmann, there were significantly more females than males in the precontemplation stage and significantly fewer females in the action stage<sup>7</sup>. In contrast, findings of this study showed no significant association between sex and the state of change of the respondents.

The association of civil status and BMI classification with the state of change as assessed via RASP-B were the novelty of the current study, which had not been done in the previous study. Findings revealed that the two factors were not associated with the outcome interest. Hence, any counseling program aimed at reinforcing the action stage can be implemented in the institution without restriction based on sex, civil status, or BMI classification.

The recruitment of patients consulting at Ospital ng Maynila Medical Center (OMMC) for the purposes of this study serves as a limitation thereby affecting the generalizability of the findings. However, the careful implementation of the study in strict adherence to the approved protocol ensures the internal validity of the findings. Hence, for future research, conducting a population-based cross-sectional study may be implemented to address such limitations.

### **Conclusions**

The feasibility of using a translated version of the RASP-B questionnaire in Filipino language to determine the readiness to change sun-protective behaviors among Filipino adult patients was assessed in this study.