HEALTH EDUCATION RESEARCH Vol.31 no.6 2016
Pages 792–802
Advance Access published 15 October 2016

Decision making for Pap testing among Pacific Islander women

Jie W. Weiss[1], Michele Mouttapa[1], Lola Sablan-Santos[2], Jasmine DeGuzman Lacsamana[1], Lourdes Quitugua[2] and Sora Park Tanjasiri[1]

[1]Department of Health Science, California State University, Fullerton and [2]Guam Communications Network, Inc
*Correspondence to: Jie W. Weiss. E-mail: jweiss@fullerton.edu, jweiss@fullerton.edu

Received on August 29, 2015; accepted on September 11, 2016

Abstract

This study employed a Multi-Attribute Utility (MAU) model to examine the Pap test decision-making process among Pacific Islanders (PI) residing in Southern California. A total of 585 PI women were recruited through social networks from Samoan and Tongan churches, and Chamorro family clans. A questionnaire assessed Pap test knowledge, beliefs and past behaviour. The three MAU parameters of subjective value, subjective probability and momentary salience were measured for eight anticipated consequences of having a Pap test (e.g., feeling embarrassed, spending money). Logistic regression indicated that women who had a Pap test (Pap women) had higher total MAU utility scores compared to women who had not had a Pap test within the past three years (No Pap women) (adjusted Odds Ratio = 1.10). In particular, Pap women had higher utilities for the positive consequences '*Detecting cervical cancer early*, *Peace of mind*, and *Protecting my family*', compared to No Pap women. It is concluded that the connection between utility and behaviour offers a promising pathway toward a better understanding of the decision to undergo Pap testing.

Introduction

In recent years, incidence and mortality rates for cervical cancer in the United States have decreased dramatically, in large part due to increased Pap testing [1]. However, those rates have tended to increase among Pacific Islanders [2]. Pacific Islanders (PIs) in the continental U.S. originate from Melanesia, Micronesia (e.g., Chamorros) and Polynesia (Samoans and Tongans). Age-adjusted incidence rates among selected PIs (12.3/100 000 Native Hawaiians; 15.1/100 000 Samoans) were higher than that of non-Hispanic whites (NHWs) (8.1/100 000) [3]. Stage of diagnosis is later for PIs than for NHWs; only about 40% of NHW cervical cancers are found at the regional or distant stage, compared to nearly 60% of the same cancers among Native Hawaiian and Samoan women.

Even with HPV testing and vaccines, Pap testing remains an important cervical cancer prevention and detection method. The *U.S. Preventive Services Task Force* (USPSTF) recommends women age 21–65 receive Pap testing every 3 years [4]. Unfortunately, the Pap test is severely underutilized among many ethnic/racial groups. PIs have low rates of Pap testing. Only 71% of Asian American and Pacific Islander (AAPI) women age 25+ years received a Pap test within the last 3 years (U.S. average = 82%). The USPSTF has called for increased attention to informed decision making, particularly in cross-cultural populations [5,6]. To answer this call, the current study aimed to examine the decision-making process among Pacific Islander women in Southern California regarding Pap testing.

Lack of knowledge and awareness have been identified as barriers for women obtaining cervical cancer screening [7,8]. In a study by Ideström *et al.* [9], knowledge and attitudes regarding Pap testing were shown to significantly predict compliance rates

doi:10.1093/her/cyw044

of cancer screening among women. However, evidence also suggests that increased knowledge alone is insufficient to initiate or sustain cancer screening and other health behaviours [10,11]. Accordingly, theorists have developed approaches that incorporate personal, interpersonal and community factors that influence people's behaviour. These include, but are not limited to, Self-Regulation Theory [12], The Health Belief Model [13], The Theory of Reasoned Action [14], Protection-Motivation Theory [15], The Theory of Planned Behaviour [16], and Social-Cognitive Theory [17]. These theories involve sensible attempts to identify predictors using group data. They tend to focus on the risks of dangerous behaviours and the rewards of preventive behaviours, rather than considering the full range of consequences that a person thinks might attach to each possible course of action. Typically, interventions based on these theories attempt to increase knowledge and accuracy of beliefs.

Because getting tested is an individual's prerogative, a research approach that focuses on decision making has the potential to expand our understanding of intrapersonal factors that influence women's cancer screening behaviours. In this study, we adopt a descriptive version of the classical Multi-Attribute Utility Model (MAU) proposed by Keeney and Raiffa [18] to examine the decision- making process for Pap testing within the PI population. The key feature of the MAU model is that each decision option has a set of anticipated consequences attached to it. The consequences are what a decision maker (i.e., the woman) thinks might happen as the result of choosing an option. While all women desire good health, there are many other competing concerns that call for their attention and time. Deciding to go for a Pap test is a matter of managing these priorities. For the Pap test, the consequences can include short-term outcomes (such as pain, embarrassment, or inconvenience) as well as long-term outcomes (such as an extended lifespan). The MAU model also accommodates decisions that appear to be emotion-based (such as fear), in that affective consequences enter into the model in the same way that other consequences do [19].

According to the descriptive version of the MAU model [20], each decision option has a set of anticipated consequences attached to it, and the anticipated consequences of an option determine its attractiveness. The anticipated consequences constitute the 'attributes' of an option. They differ subjectively in 3 ways, giving rise to three model parameters attached to each consequence. These parameters are the components of the MAU model: (1) *Subjective Value (SV)*, the perceived worth of the consequence, a quantity with either a positive or a negative sign; (2) *Subjective Probability (SP)*, the perceived likelihood that the consequence will occur given the behavioural choice. Most knowledge is incorporated within this parameter, and (3) *Momentary Salience (MS)*, the importance of that consequence to the person at the moment of decision. The third parameter was added to the classical model to account for variations over time and circumstances [21]. When a moment of decision arises, each of the options is evaluated using the three parameters in accordance with the expression: $\mathrm{MAU} = \Sigma_j\ \mathrm{SV}_j \bullet \mathrm{SP}_j \bullet \mathrm{MS}_j$ where j indexes the consequences anticipated by the decision maker if she chooses that option. The product of the three parameters for a consequence determines that consequence's contribution to the total utility. The option with the highest utility, as expressed by the sum of the products across consequences, is chosen. The model is personalized via the parameters attached to each consequence. The parameters capture how people regard the behavioural options (e.g., to have the Pap test now or not). The number of consequences that play a role in the decision is incorporated into the model via the *Momentary Salience* parameter; a consequence that is not under consideration at the time the decision is made has zero momentary salience and therefore does not contribute to the sum.

Consequences might be expected to arise before, during, or after the test. These expectations can serve as barriers or as facilitators. It is important to note that subjective value alone does not determine whether a consequence will impact the decision. For example, a consequence such as feeling discomfort during the test might be viewed as negative in value

and therefore could constitute a barrier. But if the patient were sufficiently reassured that discomfort was unlikely, the apparent barrier would be mitigated because of the multiplicative effect of the low subjective probability.

In this study, we employ the MAU model with the hope of expanding our understanding of the complex dynamics of the decision-making process in cancer screening. While we cannot claim that increased understanding will necessarily translate into improved clinical practice, we hope that identifying the tradeoffs inherent in this very personal decision will at least soften the attitudes of those who disparage people with whose choices they disagree

Methods

Study design

The data presented in this paper are from the initial phase of a five-year study that used Community-Based Participatory Research (CBPR) strategies involving staff from four community-based organizations, one university, and PI community leaders and cancer survivors who serve on a Community Advisory Board. The CBPR process and study recruitment approaches have been described elsewhere (Tanjasiri *et al.*, in preparation).

Participants

We recruited adult PI women and their husbands/long-term partners from Samoan and Tongan churches and Chamorro family clans who reside in urban areas in Southern California. The leaders from each organization (church or clan) invited eligible couples to participate. Eligibility criteria for the women included being: (1) Chamorro, Samoan or Tongan and being a member of at least one of the organizations or clans enrolled this study, (2) between the ages of 21 and 65 and (3) married or in a long-term relationship with a man of any ethnicity for at least five years. For this study, 311 women who had received Pap tests within the last three years (Pap women) and 274 women who had not (No Pap women) completed the baseline survey. Hence, the analytic sample for this study was 585 women participants.

Procedures

Recruitment

We utilized an organizational sampling approach to recruit Samoan and Tongan churches and Chamorro clans. An official letter with contact information of the university and community partners, along with compensation of food or a cash equivalent of $200, was given to each church and clan as an act of good faith that they will be part of the project. The incentive was provided to show respect to the community organizations for their crucial role in the study, which the PI leaders indicated had been a concern regarding past studies carried out among this population. The project health educators spearheaded the recruitment process, which often involved multiple follow up calls, in-person meetings, and attendance at social events such as family parties, village fiestas and festival events, and church activities. Once the leader(s) of a given church or clan agreed to have their organization or clan participate the study, the health educator scheduled a meeting at the community's site, to administer the baseline survey and implement the 2-h education among the eligible community participants.

Survey administration

The health educators administered the self-report instrument to the participants. The questionnaires were provided in both English and in the participants' native language. Participants were instructed to complete one page at a time, and to wait until everyone had completed that page. Therefore, if any, questions came up, the health educator was able to address the questions with the entire group. After completing the survey, each participant received a small cultural gift and a $10 gift card. All procedures described here were approved by the University's Institutional Review Board.

Survey translation

Survey translation from English into the native PI language was completed by a bilingual and

bicultural translator, and then independently reviewed by a second translator checking for clarity, minimal use of jargon, utilization of conceptual equivalents of words and phrases rather than a literal translation, and use of appropriate words with consideration of the audience. Questionnaires were pilot tested on 18 community members who met all eligibility requirements of the study but were not participants.

Measures

The questionnaire included the following topics: demographics, knowledge of Pap tests and cervical cancer risks, knowledge and attitudes, decision-making utility and Pap screening behaviours.

Demographics

All participants were asked basic information about ethnicity, age, education level, health insurance status (including public and private, such as military insurance which is common among Chamorros), marital status, immigration status and English language ability.

Cervical cancer-related knowledge

Participants completed 11 true/false items which assessed participants' knowledge about cervical cancer risk factors including sexual history, human papilloma virus infection, smoking, diet, oral contraceptives and family history. The items came from existing surveys of PI cancer control [22,23] and the National Health Interview Survey, Cancer Control Supplement [24].

Pap testing behaviour

Women were asked if they have ever had a Pap smear, and the date of their last Pap smear in the participants' baseline survey: 'When did you have your most recent Pap test?' Based on the American Cancer Society recommendation that all women 21 and older receive Pap tests at least once every 3 years [25], we categorized women who answered 'within the past 3 years' as having had Pap testing.

Consequences list

Prior to finalizing the questionnaires, we conducted 4 focus groups drawn from the same pool of PI women in order to develop a list of consequences of Pap testing as perceived by this population. These elicited responses were tabulated, then pruned by the research team. The objective is to have a set of consequences that are independent (to yield proper weighting) and exhaustive (to ensure that the consequences deemed important by the focus groups are examined). Eight consequences emerged from this process: *'Detecting cervical cancer early'*, *'Having peace of mind by getting a Pap test'*, *'Feeling discomfort during a Pap test'*, *'Spending money for getting a Pap test'*, *'Feeling embarrassed while having a Pap test'*, *'Protecting my family'*, *'Time spent getting a Pap test'*, *'Feeling scared of knowing my Pap test result'*.

MAU model parameters

Questions in this section examined MAU with respect to the decision for Pap testing. The respondent was asked to provide three ratings, one for each of the three model parameters, for each anticipated consequence of the Pap test.

Each parameter was investigated on a separate page. For subjective value, the response options ranged from 'extremely bad' to 'extremely good'. Each response was scored as a number between -3 (extremely bad) and +3 (extremely good). For subjective probability, the response options ranged from 'completely unlikely' to 'completely likely'. These responses were scored as numbers between 0 (completely unlikely) and 5 (completely likely), and were then linearly transformed so their range was 0–1, so that they would resemble probabilities. For example, a score of 5 was transformed to 1 to reflect a 100% perceived likelihood that the consequence would occur if the participant received a Pap test. For momentary salience, the response options ranged from 'not important at all' to 'extremely important'. These responses were also scored as numbers between 0 and 5 and were transformed in the same way as likelihood responses were. These rating scales have previously been used to measure utility parameters in studies in

which the consequences were associated with smoking [26] and healthy eating [27].

Calculation of MAU parameters

We were interested in determining the extent to which the component utilities for individual consequences (e.g., peace of mind, protecting my family, etc.) were associated with Pap testing. An MAU score was calculated for each of the eight consequences. For each respondent, the subjective value for a consequence (which ranged from -3 to +3) was multiplied by the corresponding subjective probability and momentary salience (which had both rescaled to range between 0 and 1). Because the multipliers were positive quantities between zero and one, the products ranged between -3 and +3, carrying the signs of the values. These products were then averaged across respondents to form the utility score for each consequence. The averages were then summed over the eight consequences to create a total utility score.

Data analyses

Pearson's chi-square tests were performed to compare Pap and No Pap women on the dichotomous demographic variables. ANOVAs were performed to examine differences between Pap and No Pap women on the number of knowledge questions answered correctly and years of marriage. Separate ANOVAs compared Pap and No Pap women on the total utility scores, the subjective value score, the subjective probability score, and momentary salience score, and scores for each of the eight consequences. Multiple logistic regression models were run for each of the MAU predictor variables in the ANOVA analyses, adjusting for the three demographic variables (Ethnicity, Insurance and Knowledge) that were found to be associated with Pap testing in the demographic analyses.

Results

Demographic characteristics of participants

Table 1 presents demographic characteristics of female participants by Pap testing status. Women with health insurance had Pap testing rates over twice as high (60.4%) as women without health insurance (26.6%, $P = 0.000$). Samoan and Chamorro participants (61.3%) had Pap testing rates that were nearly twice as high compared to Tongan women (31.4%, $P = 0.000$). Samoan and Chamorro women were combined because they did not significantly differ from each other on Pap testing status (58.2%

Table I. *Descriptive statistics of the female participants* (n = *585)*

	No Pap test within 3 years ($n = 274$)		Pap test within 3 years ($n = 311$)			
	N	%	*n*	%	χ^2	*P*
Demographic Characteristics						
Age- Under 40 years	110	45.6	131	54.4	0.25	0.970
Age- 40+ years	161	47.4	179	52.6		
Tongans	109	68.6	50	31.4	41.35	0.000
Samoans and Chamorros	165	38.7	261	61.3		
Have health insurance	180	39.6	275	60.4	44.78	0.000
No insurance	91	73.4	33	26.6		
Other language preferred	48	57.8	35	42.2	8.56	0.073
English or other language	118	48.0	128	52.0		
English language preferred	108	42.9	144	57.1		
	M	SD	M	SD	*F*	*P*
Number of years in marriage/relationship	17.42	12.50	16.81	11.72	0.549	0.359
Cervical cancer knowledge (out of 11)	5.62	2.66	4.72	3.00	13.82	0.000

Table II. *Mean Utility Score for Each Consequence, by Pap Test History*

	No Pap in Past 3 years (n =274)	Pap in Past 3 years (n = 311)	F	P
	M (SD)	M (SD)		
Total Utility Score[a]	4.54 (3.64)	5.78 (3.05)	18.59	0.000
Utility Scores for Individual Consequences				
Detecting cervical cancer early	0.89 (0.75)	1.04 (0.77)	5.54	0.019
Peace of mind	1.12 (0.75)	1.39 (0.74)	19.10	0.000
Feeling discomfort	0.05 (0.57)	0.02 (0.50)	0.62	0.433
Spending money	0.42 (0.75)	0.51 (0.74)	2.168	0.141
Feeling embarrassed	0.03 (0.56)	0.03 (0.42)	0.04	0.848
Protecting my family	1.17 (0.81)	1.49 (0.71)	25.10	0.000
Time spent	0.88 (0.83)	1.22 (0.77)	25.00	0.000
Feeling scared	0.01 (0.87)	0.04 (0.76)	0.18	0.676

[a]The total utility score is the sum of the utility scores for the eight consequences.

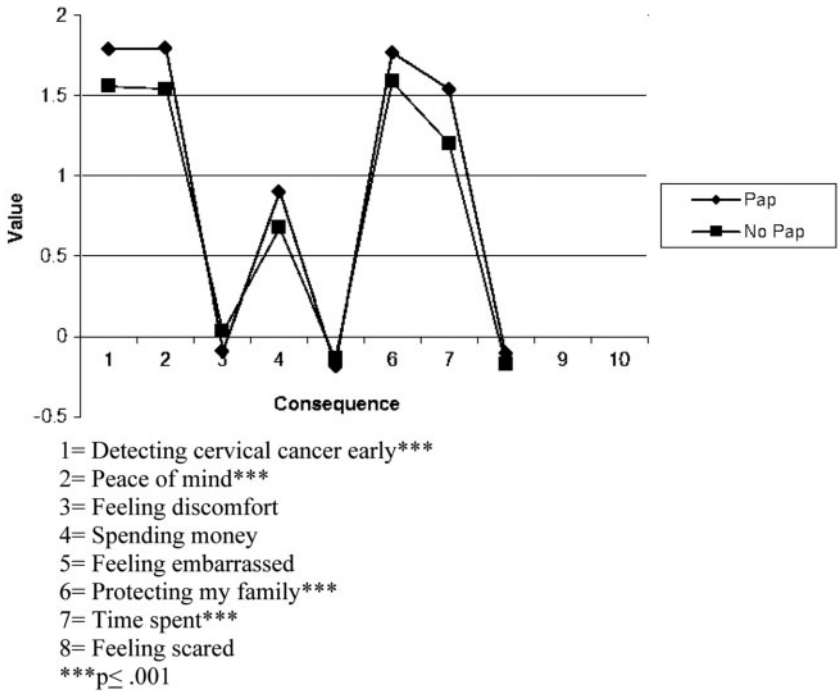

Fig. 1. Mean Subjective Value for Each Consequence, by Pap Status.

and 65.7% , respectively, $P = 0.116$). Pap women had significantly lower average scores on the knowledge scale (5.62 ± 2.66) compared to No Pap women (4.72 ± 3.00).

Mean MAU scores by Pap test status

Table 2 presents average parameter scores for total utility scores of the three parameters (subjective value, subjective probability and momentary

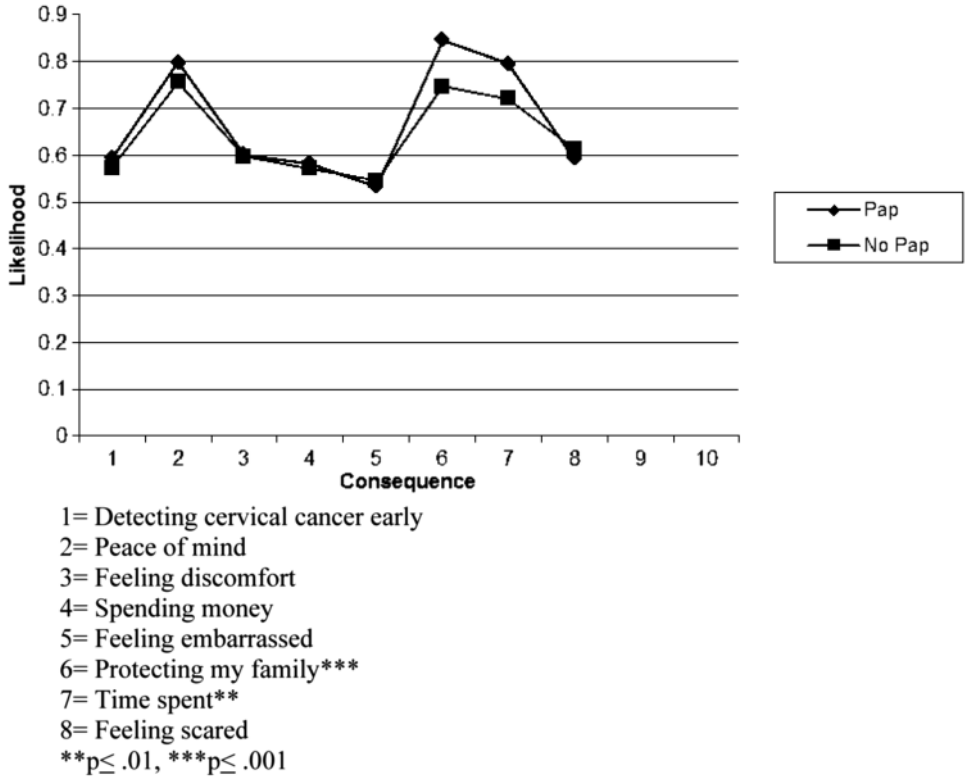

Fig. 2. Mean Subjective Probability for Each Consequence, by Pap Status.

salience). Pap women had significantly higher means for total MAU scores (5.78 ± 3.05) and subjective values (0.93 ± 0.44) compared to No Pap women (4.54 ± 3.64 and 0.78 ± 0.51, respectively). These differences confirm that those who took the Pap test appreciated its virtues more than those who did not. Looking at utility scores for individual consequences, we found that Pap women had significantly higher scores for the positive consequences of *Detecting cervical cancer early* (1.04 ± 0.77), *Peace of mind* (1.39 ± 0.73), *Protecting my family* (1.57 ± 0.67), and were more tolerant of *time spent* (1.22 ± 0.77) compared to No Pap women (0.88 ± 0.77, 1.12 ± 0.75, 1.36± 0.78 and 0.88 ± 0.05, respectively).

Figure 1 shows that the observed differences in utilities were largely driven by the differences in subjective values. Figure 2 illustrates that for almost all consequences, subjective likelihoods for Pap women and No Pap women were comparable. This means that most women have the same picture regarding what the procedure will do to and for them. The exceptional consequences were '*Protecting my family*' and '*Time spent*'. Those who took the test thought them more likely to occur than those who did not. The rather high magnitudes of the likelihoods (all were over .5) confirm our choices of these consequences as accurately characterizing the test.

Momentary saliencies are shown in Fig. 3. While both groups assigned similar, slightly negative subjective values to discomfort and embarrassment, the No Pap women reported significantly higher momentary salience of the anticipated adverse consequences, which were *'Feeling discomfort'* and

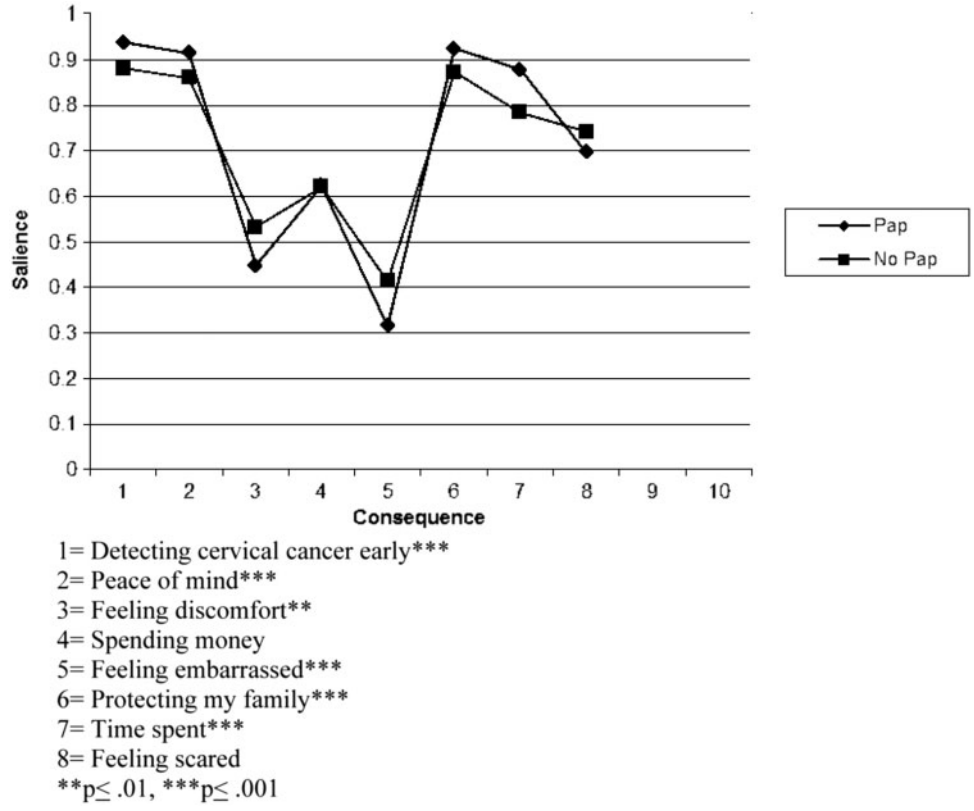

Fig. 3. Mean Momentary Salience for Each Consequence, by Pap Status.

'Feeling embarrassed'. Their focus on these negative aspects of Pap testing was associated with the decision to forego the procedure.

Logistic regression of Pap status

We also conducted a logistic regression analysis of Pap test status, controlling for variables significantly associated with Pap testing as described in Table 1, specifically ethnicity, health insurance coverage and knowledge. The higher total utility was significantly associated with higher rates of Pap testing (AOR (Adjusted Odds Ratio) = 1.10, 95% CI= 1.04–1.17, $P = 0.001$)) . Thus, women for whom the utility of the procedure is higher are more likely to have been tested.

Discussion

This is perhaps the first study to use the MAU model to examine Pap testing decision-making process in an underserved minority population. The primary result is that women who got tested had higher utility for the test than those who did not. The importance of the finding is that the utility construct integrates the various reasons underlying a decision in a structured way. Examining individual consequences, we found that utilities for the three positive consequences of Pap testing (namely '*Detecting cervical cancer early*', '*Peace of mind*', and *'Protecting my family*') were higher among women who had a Pap test in the past three years compared with those who had not. The

effect of the latter consequence is consistent with previous research that has found family values to be a strong predictor of having a Pap test [28]. We also found that three purportedly negative consequences (*Feeling discomfort, Feeling embarrassed, Feeling scared*) have utilities near zero, suggesting that they contribute little to the decision.

The results showing the impact of utility on health-related behaviours are consistent with previous research showing that MAU for tobacco was on average higher among those who used tobacco than among those who did not [26] and MAU for healthy eating was higher for those who ate healthily than for those who did not [27]. The MAU analysis clarifies how perceived consequences influence behaviour. The main distinction between the groups is that those who took the test assigned higher value to the positive anticipated consequences of Pap testing, including '*Detecting cervical cancer early*', '*Peace of mind*', and '*Protecting my family*'.

Limitations

Use of the MAU model to understand everyday decision making entails compromises not confronted when the model is employed in controlled research settings. The customary caution regarding retrospective self-reports applies, although because the topic is not sensitive, there is little reason to expect intentional inaccuracy [29]. While we were not able to check the medical records, having had a Pap test is a salient event not likely to be forgotten. Similarly, we accept the responses that report parameters at face value, as there is no way to validate these internal quantities. Still, just as for smoking [26] and healthy eating [27], incorporating self-reported parameters into model-based utilities allows us to predict real-world behaviour.

An additional limitation imposed by a retrospective approach is that causality cannot be inferred. For example, although we found that PI women with higher MAU scores were more likely to have taken the Pap test in the past 3 years, we cannot be certain that higher MAU is a precursor to, rather than a result of, testing. In principle, a prospective study might allow stronger conclusions, and would also allow within-person comparisons of the MAU for testing vs. no testing. According to the model, each individual makes the decision after comparing MAU for the two options. It is experimentally challenging to elicit utilities for the no testing option. Furthermore, a prospective study may change the nature of the research. The deliberation invoked by prior elicitation could influence the subsequent choice. In that sense, a prospective examination would constitute an intervention rather than a description of the behavioural choice in the natural setting.

Another usual caveat regarding the specific sample applies to this study. The sample was limited to primarily church-going or clan-affiliated Pacific Islanders. It is possible that these findings may not generalize to other populations. Also, the sample was limited to women in long-term relationships, because we were interested in how support from a partner might influence the testing decision. A consequence such as '*Protect my family*' would not be relevant to single women.

Conclusion

The findings of this study reinforce the wisdom underlying the call by the U.S. Preventive Services Task Force for increased attention to decision making, particularly within cross-cultural populations [6]. Our results suggest that possession of relevant information about risk factors is not what distinguishes those who receive a Pap test from those who do not. We interpret the data as suggesting that interventions whose focus is increased knowledge can be expected to have limited efficacy; current educational ventures are sufficient for understanding.

In contrast to results obtained previously [7–9], our respondents who chose to get tested actually exhibited less knowledge. A possible explanation for these conflicting outcomes is that knowledge can cut both ways. A more knowledgeable patient may determine her personal risk to be low, and

thereby decide to forego testing. This suggests it might be worthwhile in future research to ask participants to report their views of their own risk factors.

What differentiates our groups is an appreciation of the positive emotional consequences of testing. Those who receive the test value the peace of mind that comes with a good test outcome, and accept that early detection will allow preservation of their family in the case of a bad test outcome. The results suggest that these are the consequences that practitioners would do well to emphasize.

Identifying the concerns that influence adherence to what health professionals view as routine recommendations may enable more effective implementation. The medical community tends to regard a problem as solved once an effective intervention or procedure has been developed [30], but there is another important step to consider. Personal decisions determine the ultimate success of the medical advance. Understanding the reasons that underlie those decisions promises to be more useful than merely identifying predictors. Decision-making theory holds the potential for expanding our understanding of how tailored interventions can influence women's cancer screening behaviours by highlighting the needs and priorities of medically underserved consumers. More fine-grained analyses, such as comparing differences in utilities and behaviour across ethnic groups or across groups that differ according to age, economic status or other predictors, may offer a pathway toward realizing that potential.

Acknowledgements

We would like to recognize the following individuals for their contributions to the project: Mohammed Aftab, Alisa Chavarria, Laura Dandridge, Rine Fe'a, Peter Flores, Preciosa Flores, Mary Anne Foo, Ualani Hoòpai, Brian Hui, Genesis Lutu, Darlene March, Vanessa Tui'one May, Noelle Moananu, Ciara Paige, Peniamina Taito, Alisi Tulua, Lourdes Tuliau, Marina Tupua, Elenoa Vaikona, Dorothy Schmidt-Vaivao, Isileli Vunileva and Jennifer Xiong, Additionally, we would like to recognize the churches, clans and Community Advisory Board members who participated in this study. This project was funded by the National Cancer Institute's Center to Reduce Cancer Health Disparities (grant number 5R01CA149324). The content is solely the responsibility of the authors and does not necessarily represent the official views of the NCI CRCHD.

We dedicate this paper to the memory of Caroline Fèa Pele, who we lost to cancer on July 4, 2015.

Funding

This project was supported by the National Cancer Institute's Center to Reduce Cancer Health Disparities, grant number 5 R01CA149324-05. The contents are solely the responsibility of the authors and do not necessarily represent the official views of the NCI CRCHD.

Conflict of interest statement

None declared.

References

1. Siegel R, Naishadham D, Jemal A. Cancer statistics. *CA Cancer J Clin* 2013; **63**:11–30.
2. Tsui J, Saraiya M, Thompson T *et al*. Cervical cancer screening among foreign-born women by birthplace and duration in the United States. *J Womens Health* 2007; **16**:1447–57.
3. Miller BA, Chu KC, Hankey BF *et al*. Cancer incidence and mortality patterns among specific Asian and Pacific Islander populations in the US. *Cancer. Cause Control* 2007; **19**:227–56.
4. United States Preventive Services Task Force. *Final Update Summary: Cervical Cancer: Screening*. United States Preventive Services Task Force, 2012. Available at: http://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/cervical-cancer-screening. Accessed on August 11, 2015.
5. Bellinger JD, Millegan W, Abdalla AE. "I'm not ashamed to talk on it!": African-American women's decisions about cervical cancer prevention and control in South Carolina. *Womens Health Iss* 2014; **25**:120–7.
6. Briss P, Rimer B, Reilley B *et al*. Promoting informed decisions about cancer screening in communities and healthcare systems. *Am J Prev Med* 2004; **26**:67–80.
7. Nguyen-Truong CK, Lee-Lin F, Leo MC *et al*. *A*. community-based participatory research approach to understanding

Pap testing adherence among Vietnamese-American immigrants. *J Obstet Gynecol Neonatal Nurs* 2012; **41**:E26–40.
8. Tanjasiri SP, Sablan-Santos L. Breast cancer screening among Chamorro women in southern California. *J Womens Health Gend Based Med* 2001; **10**:479–85.
9. Ideström M, Milsom I, Andersson-Ellström A. Knowledge and attitudes about the Pap-smear screening program: a population-based study of women aged 20–59 years. *Acta Obstet Gynecol Scand* 2002; **81**:962–7.
10. Tanjasiri SP, LeHa'uli P, Finau S *et al*. Tongan-American women's breast cancer knowledge, attitudes, and screening behaviors. *Ethn Dis* 2002; **12**:284–90.
11. Tsark JU, Braun KL. Ten-year changes in breast cancer knowledge, attitudes, and practices in Native Hawaiian women. *Pac Health Dialog* 2001; **8**:280–9.
12. Kanfer FH. Self-regulation: Research, issues and speculations. In: Neuringer C, Micheal JL (eds.). *Behavior Modification in Clinical Psychology*. New York: Appleton-Century-Crofts, 1970, 178–220.
13. Rosenstock JM. Historical origins of the Health Belief Model. *Health Educ Monogr* 1974; **2**:1–9.
14. Fishbein M, Ajzen I. *Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research*. Reading, MA: Addison-Wesley, 1975.
15. Maddux JE, Rogers RW. Protection motivation and self-efficacy: A revised theory of fear appeals and attitude change. *J Exp Soc Psychol* 1983; **19**:469–79.
16. Ajzen I. The theory of planned behavior. *Organ Behav Hum Dec* 1991; **50**:179–211.
17. Bandura A. Social cognitive theory and exercise of control over HIV infection. In: DiClemente RJ, Peterson JL (eds.). *Preventing AIDS: Theories and Methods of Behavioral Interventions*. New York: Plenum Press, 1994, 25–59.
18. Keeney RL, Raiffa H. *Decisions with Multiple Objectives*. New York: John Wiley and Sons, 1976.
19. Mellers BA, McGraw AP. Anticipated emotions as guides to choice. *Curr Dir Psychol Sci* 2001; **10**:210–4.
20. Weiss JW, Weiss DJ, Edwards W. Big decisions, little decisions: The hierarchy of everyday life. In: Weiss JW, Weiss DJ (eds.). *A Science of Decision Making: The Legacy of Ward Edwards*. New York: Oxford University Press, 2009;451–60.
21. Weiss JW, Weiss DJ, Edwards W. A descriptive multi-attribute utility model for everyday decisions. *Theory Decis* 2010;**68**:101–14.
22. Dang J, Lee J, Tran JH. Knowledge, attitudes, and beliefs regarding breast and cervical cancer screening among Cambodian, Laotian, Thai, and Tongan women. *J Cancer Educ* 2010; **25**:595–601.
23. Mishra SI, Aoelua PL, Hubbell FA. Knowledge of and attitudes about cancer among American Samoans. *Cancer Detect Prev* 2000;**24**:186–95.
24. Hewitt M, Breen N, Devesa S. Cancer prevalence and survivorship issues: Analyses of the 1992 National Health Interview Survey. *J Natl Cancer I* 1999;**91**:1480–6.
25. American Cancer Society. *Cancer Facts & Figures 2012*. Atlanta, Georgia: American Cancer Society, 2012.
26. Weiss JW, Edwards W, Mouttapa M. The puzzle of adolescent substance initiation. In: Weiss JW, Weiss DJ (eds.). *A Science of Decision Making: The Legacy of Ward Edwards*. New York: Oxford University Press, 2009;439–50.
27. Hanlon AS, Weiss JW, McMahan S, Cheng E. Using the Multi-Attribute Utility model to better understand fruit and vegetable intake among college students. *Calif J Health Promot* 2012;**10**:40–56.
28. Mishra SI, Luce PH, Hubbell FA. Predictors of Papanicolaou smear use among American Samoan women. *J Gen Intern Med* 2001; **16**:320–4.
29. Ong AD, Weiss DJ. The impact of anonymity on responses to "sensitive" questions. *J Appl Soc Psychol* 2000; **30**:1691–708.
30. Ulmer RA. *Legal Guide to Patient Compliance*. New York: John Wiley and Sons, 1996.