



Research Article

DIFFERENCE OF RESPONSES AMONG FACE TO FACE, TELEPHONE, AND ONLINE SURVEY: A PILOT STUDY IN MEASURING WILLINGNESS TO PAY PER QALY OF THREE HEALTH CONDITIONS

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ABSTRACT

This study examines responses to Willingness to pay (WTP) questions across face to face, telephone, and online modes of administration. The three modes of survey data sets used in this study and delivered to different sample group for a total of 90 respondents conveniently. Dichotomous bidding followed by open-ended questions was employed to examine respondents' WTP for three scenarios. Descriptive statistics were applied to explain demographic and characteristics as well as the WTP values. The *Chi-Square* test and *Kruskal-Wallis* test were used to evaluate the differences responses between modes of administration. Demographic variables including sex, age, household income, expense, number of dependents showed no significantly different between the samples. Across all three modes, participants' response rate was higher, higher interpretation rate, and more costs of survey in face to face sample, but no statistically different. There was no difference in WTP maximum of life saving scenario among three modes of administration. Online elicitation can be more successful in generating valid responses than paper-based surveys, especially for sensitive issues. It may be possible to extend our findings to other valuation methods, and further work should consider the stability of choice preference elicitation techniques across different administration modes.

Keywords: Willingness to pay; modes of administration; quality of life

INTRODUCTION

Willingness to pay (WTP) measure has been proposed to be implemented in cost-effectiveness analysis as an alternative threshold¹. Many studies have attempt to estimate the WTP value as a ceiling threshold using the basis of empirical evidence on societal values^{2, 3}. A value of WTP depends on multi factors including type of health gain as well as patient' characteristics^{4, 5}. Furthermore, a value of WTP also varies widely on socioeconomic status, disease severity, duration of health gain, and elicitation method used⁶⁻⁸. Early assessment using self-administered survey to elicit WTP values demonstrated that individuals face difficulties in comprehending WTP questions⁹.

Because of complexity with self-administration, many researchers employed face-to-face interviews as a gold standard for eliciting WTP values.^{10, 11} Interview has several benefits including interviewer is able to explain the detail tasks and provide feedback to ensure the subject understanding and comprehension¹². However, face-to-face interview is time consuming and costly, can introduce bias because of selection, location and timing of administration, and can increase social desirability bias.

A meta-analysis evaluated differences in frequency of positive answers showed that telephone respondents more frequently gave positive responses compared to mail or internet respondents, but not to face-to-face respondents¹³. A desirability bias in answering questions is prompted by the actual presence of an interviewer. Online method for eliciting WTP values offers an inexpensive approach to obtain data from internet users. A few studies have employed an online survey instrument to elicit WTP values with valid results^{14, 15}. Definite aspects of interviewer-administered

surveys can be replicated using an online survey, and users have indicated high levels of assurance and shown a preference for computerized surveys^{16, 17}.

No published studies have been reported comparing WTP responses elicited through telephone and online survey versus a face to face interview. We attempted to address this issue by conducting a study to determine whether people's responses were different when responding to WTP elicitation in a face-to-face interview versus telephone and online survey. In particular, we were interested in whether these three modes of elicitation influence the relative value people placed on disease severity, the likelihood of extreme responses, and the internal consistency of responses.

This study aimed to compare responses to WTP questions across face to face, telephone, and online modes of administration. We hypothesized that the responses from different types of WTP valuation questions do not differ across modes.

MATERIALS AND METHODS

Study participants

This study was done by administering identical surveys where the only difference was the mode of collection of data. For the telephone and online survey, respondents were derived from an existing region database and internet users were selected conveniently. Potential respondents were healthy people living in Yogyakarta Province, Indonesia were screened out before starting the experimental questions. Subjects were recruited through local announcement with age range of 18-65 years. The three modes of survey scaled down proportionally for an achieved minimum sample of 90. This attempted to ensure the overall comparability

of the sample characteristics across the administration modes. The face-to-face, telephone, and online survey data sets used in this study contained identical set of willingness to pay questionnaire in the same order we delivered to different sample group. Informed consent was anonymous and ethical approval of this study was obtained from Medical and Health Research Ethical Committee (MHREC) with approval number KE/FK/0362/EC/2017. These data were part of a wider research project stated elsewhere.¹⁸

Questionnaire of health states

The questionnaire consisted of three main components, namely general information, utility measure, and willingness to pay measure with three hypothetical scenarios. We developed 3 versions of scenarios namely treatment, terminal illness and life-saving described elsewhere.¹⁸

Each respondent was assigned to imagine hypothetical health state and *Euroqol*-five-dimensions (EQ-5D-5L)-Visual Analogue Scale (VAS) instrument was to measure utility score associated with the assigned hypothetical health state. The EQ-5D-5L describes health status across five dimensions mobility, self-care, usual activities, pain/discomfort, and anxiety/depression, each with five response levels: no, slight, moderate, severe, and extreme/unable. Then, they were asked to rate their current health state and the corresponding hypothetical health state on the scale.

WTP elicitation

Dichotomous bidding followed by open-ended questions was employed to examine respondents' WTP for each scenario. Dichotomous bidding as percentage of Gross Domestic Product (GDP) per capita was used. To avoid starting point bias, each respondent was randomly assigned on a defined starting price. The "yes"/"no" answer to the first price offered to the respondent determine the next price presented. The open-ended question was solicited after the second bidding to examine the maximum WTP amount.

Data analysis

Descriptive statistics were applied to explain demographic and patients characteristics as well as the WTP values, using percentage and frequencies for the categorical variables and means, standard deviation for the continuous variables. The *Chi-Square* test was employed for categorical variables and *Kruskal-Wallis* test was used to evaluate the differences responses between modes of administration. All analysis was performed using SPSS version 15.0. The significance level was set at p-value less than 0.05.

RESULTS

Respondent characteristics and responsiveness of administration modes

In total, 90 respondents accomplished the face to face interview, telephone survey or online version. There were significant differences between the groups by an occupation, marital status, having assets, experience in using health services, insurance types, and health problem, but a number of demographic variables showed no significantly differed between the samples. These included sex, age, household income, expense, number of dependents. Among these, there were more women, older people, lower education level, being married, low household income, no illness history in face-to-face interview respondents (Table 1).

In terms of the completion time, the face to face sample took significantly longer to complete the overall survey. Missing response in the face to face was also lower than online and

telephone samples. Completion time and missing response was statistically different between the samples. Across all three modes, participants' response rate was higher, higher interpretation rate, and more costs of survey in face to face sample, but no statistically different (Table 2).

Means and standard deviations of the utility scores in each sample are summarized in Table 3, for face to face interview, telephone and online survey method. There were statistically different between three modes in terms of EQ-5D score today, EQ-5D VAS hypothetical scenario and utility gain using EQ 5D index score among moderate condition hypothetical scenario. For terminal illness and life-saving scenario, compared to face to face interview, the measures' values showed very small changes in telephone and online survey. This indicates that there was no potential difference of responses for the self-report measures across the survey methods, especially for scenario of terminal illness and life-saving (Table 3).

Willingness to pay between modes of administration

Across the modes of administration, it was found that willingness to pay in moderate condition and terminal illness, willingness to pay at 1st bidding in terminal illness, and willingness to pay at 2nd bidding in moderate and terminal illness were significantly different. WTP maximum was statistically different in moderate condition and terminal illness. Respondents in face to face answered slightly higher WTP maximum rather than telephone and online survey (Table 4). There was no difference in WTP maximum of life saving scenario among three modes of administration.

DISCUSSION

This article reports on a comparison between a conformable set of WTP questionnaire designed to test issues related to health state valuation conducted in online, telephone and face-to-face conditions among different set of respondents. Young respondents with mean age 26 (SD 4.42), higher level of education (86.67%), and higher income (75.33%) were more likely to join the online survey rather than the rest methods. However, these demographic variables including sex, age, household income, expense, number of dependents showed no significantly difference between the samples.

Previously, face-to-face interviews were seen as the best way to administer the survey, and this is the standard mode used to derive patients' preferences. Currently, there have been advances in technology and interest in the use of online preference valuation techniques is emerging. In accordance to this, utility measure and WTP valuation methods that are answerable to online administration, based on discrete choice questions, have been developed. The results suggest that there is no difference between the responses to utility score valuation tasks across the administration modes in two of three scenarios.

Our study highlighted that the level of non-response was higher in the online mode than in the face-to-face interview mode. The reasons might be the presence of an interviewer and their influence in approaching targeted respondent to participate may contribute for the higher response rate in face-to-face interview¹⁹. We have also assessed the time taken to complete the survey. An online respondent completed the survey faster than other modes. This may be because an interviewer is not present and it is likely for the respondent to complete the survey without fully paying attention or engaging in the task²⁰. Future research may investigate respondent engagement in the online method in more detail.

Table 1: Comparison of socio-economic variables between samples

Characteristics	Face to Face N (%)	Telephone N (%)	Online N (%)	P-value
Sex				0.53
male	7 (23.33)	11 (36.67)	9 (30)	
female	23 (76.67)	19 (63.33)	21 (70)	
Age (years, mean, SD)	38.63 (5.43)	34.53 (4.20)	26 (4.42)	0.534
Highest completed education				
upper secondary high school	23 (76.67)	13 (43.33)	6 (13.33)	
higher education	7 (23.33)	17 (56.67)	24 (86.67)	
Occupation				0.007*
unemployed/housewife	8 (26.67)	4 (13.33)	15 (50)	
employed	22 (73.33)	26 (86.67)	15 (50)	
Marital status				0.000*
single	1 (3.33)	9 (30)	20 (66.67)	
married	29 (96.67)	21 (70)	10 (33.33)	
Household income				0.696
low	11 (36.67)	9 (30)	8 (26.67)	
high	19 (63.33)	21 (70)	22 (75.33)	
Household expense				0.787
low	6 (20)	4 (13.33)	5 (16.67)	
high	24 (80)	26 (86.67)	25 (83.33)	
Number of dependents				0.638
<=4	21 (70)	21 (70)	18 (60)	
>4	9 (30)	9 (30)	12 (40)	
Status in the household				0.271
member of household	21 (70)	22 (73.33)	26 (86.67)	
head of household	9 (30)	8 (26.67)	4 (13.33)	
Asset				0.000*
no have	1 (3.33)	1 (3.33)	16 (53.33)	
have	29 (96.67)	29 (96.67)	14 (46.67)	
Experience in using health services				0.000*
no experience	5 (16.67)	7 (23.33)	5 (16.67)	
have experience	25 (83.33)	23 (76.67)	25 (83.33)	
Insurance				0.000*
no have	23 (76.67)	13 (43.33)	4 (13.33)	
have	7 (23.33)	17 (56.67)	26 (86.67)	
Health problem				0.021*
no have	16 (53.33)	16 (53.33)	25 (83.33)	
have	14 (46.67)	14 (46.67)	5 (16.67)	
Illness history				0.106
no have	22 (73.33)	17 (56.67)	14 (46.67)	
have	8 (26.67)	13 (43.33)	16 (53.33)	

*significant at p < 0.05

Table 2: Test results of response rate and time spent between modes

Variables	Mode of administration			P value
	Face-to-face	telephone	online	
Response rate (%)				
moderate condition	100	100	66	0.745
terminal illness	100	85.71	93.88	
life saving	100	100	75.86	
Missing response (%)				
moderate condition	0	0	4	0.043*
terminal illness	3.23	0	17.39	
life saving	0	0	24	
Interpretation rate (%)				
moderate condition	90	90	n/a	0.685
terminal illness	63	93	n/a	
life saving	90	90	n/a	
time spent (minutes)				
moderate condition	14	12.62	9.37	0.031*
terminal illness	19.9	15.37	11.73	
life saving	12	15.6	9.5	
Cost	+++	++	+	

*significant at p < 0.05

Table 3: Comparison of utility scores between modes

Utility scores	Face to face	Telephone	Online	p value
	Mean (SD)	Mean (SD)	Mean (SD)	
EQ-5D index score today				
- moderate condition	0.97 (0.05)	0.89 (0.09)	0.94 (0.06)	0.002*
- terminal illness	0.83 (0.18)	0.89 (0.09)	0.97 (0.06)	0.180
- life saving	0.95 (0.07)	0.96 (0.07)	0.91 (0.09)	0.077
EQ-5D VAS today				
- moderate condition	88.33 (5.62)	85.30 (10.21)	8.93 (7.93)	0.223
- terminal illness	84.33 (11.12)	87.30 (10.52)	8.73 (9.07)	0.220
- life saving	0.88 (0.15)	0.90 (0.09)	0.85 (0.07)	0.057
EQ-5D VAS hypothetical scenario				
- moderate condition	49.66 (6.28)	44.50 (19.04)	50.30 (16.38)	0.028*
- terminal illness	37.50 (19.98)	37.33 (17.10)	41.33 (20.42)	0.177
- life saving	0.19 (0.11)	0.21 (0.09)	0.25 (0.13)	0.101
Utility gain (EQ-5D index score)				
- moderate condition	0.57 (0.05)	0.50 (0.09)	0.55 (0.06)	0.002*
- terminal illness	0.80 (0.18)	0.86 (0.09)	0.93 (0.06)	0.180
- life saving	0.95 (0.74)	0.96 (0.07)	0.91 (0.09)	0.077
Utility gain (EQ-5D VAS)				
- moderate condition	0.38 (0.07)	0.40 (0.23)	0.39 (0.16)	0.910
- terminal illness	0.46 (0.23)	0.50 (0.19)	0.46 (0.22)	0.831
- life saving	0.88 (0.15)	0.90 (0.09)	0.85 (0.07)	0.057

*significant at p < 0.05

Table 4: Comparison of willingness to pay between modes

Willingness to pay	Face-to-face	Telephone	Online	p value
Willing to pay (%)				
moderate condition	100	100	93	0.000*
terminal illness	73.33	93.33	100	0.003*
life saving	67	77	68	0.667
Willing to pay at 1st bidding (%)				
moderate condition	100	100	97	0.368
terminal illness	17	70	53	0.000*
life saving	33	37	45	0.601
Willing to pay at 2nd bidding (%)				
moderate condition	97	87	40	0.000*
terminal illness	10	60	57	0.000*
life saving	30	30	9	0.633
WTP maximum (IDR 000), mean (SD)				
moderate condition	12,683 (3,882)	18,183 (18,406)	9,866 (17,709)	0.000*
terminal illness	81,333 (12,277)	44,150 (34,150)	38,116 (57,654)	0.000*
life saving	41,116 (42,776)	45,000 (40,334)	65,613 (104,991)	0.633

*significant at p < 0.05

In terms of cost, it is generally the case that face-to-face interviews are substantially more costly per respondent and may take a much longer time to recruit sufficient numbers of participants. At the same time, when the survey design is amenable to online administration, the economics of conducting interview surveys must be examined¹⁰.

Well-designed online surveys provide ways of detecting and making the user aware of potential errors and can walk subjects through online helps and tips, much as an interviewer might do. Online elicitation can be more successful in generating valid responses than paper-based surveys, especially for sensitive issues. However, our study had been concerns about the representativeness of online samples and how this might affect the comparability of results across samples. Those who are educated to a higher level may be more digitally literate, and this possibly explains their involvement in the sample. In contrast, respondents may answer face-to-face interview in a socially desirable way, called “mode effect”. Social desirability is one of the most studied mode effects. The results of these studies, however, have been inconsistent. In the face to face sample, there may be a discrepancy between actual health and reported health status because of the presence of the interviewer, which may mean that, from the respondent’s perspective, responses are not completely nameless. It may be possible to extend our findings to

other valuation methods, and further work should consider the stability of choice preference elicitation techniques across different administration modes.

CONCLUSION

Online elicitation can be more successful in generating valid responses than paper-based surveys, especially for sensitive issues. It may be possible to extend our findings to other valuation methods, and further work should consider the stability of choice preference elicitation techniques across different administration modes.

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