Comparison of face-to-face and online surveys of measuring utility for metastatic pancreatic cancer in Japan using composite time trade-off

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Background & Aim

- Composite time trade-offs (cTTO) are often used for QOL surveys in the general population[1-2]. Among these, the vignette-based method (VBM) is often used to investigate QOL values with the creation of specific disease scenarios, for example, when patient surveys are complex[3]. Although vignette-based QOL surveys are generally conducted in a face-to-face question-and-answer process between interviewer and respondent, recently, online survey without interviewers have been studied in other countries[4]. Online survey targeting general population without interviewer to measure QOL values using cTTO may improve generalization of results and reduce survey costs and time.
- However, there are concerns about respondent engagement and validation issues with online surveys[4].
- We examine the feasibility and challenges of using online survey by comparing results of cTTO-based utilities measured by both face-to-face methods (F2F) and online methods (WEB).

Method

OVERALL

- We assessed utilities of 11 health status of metastatic pancreatic cancer, developed in our previous study, using cTTO targeting to general Japanese population through online survey method without interviewers and F2F survey method with interviewers[5]. We used the cTTO online response system to remove bias between online without interviewers and F2F with interviewers in survey procedure.

HEALTH STATUS SCENARIOS

- The disease state scenarios to be answered were assumed to be patients receiving systemic chemotherapy for the treatment of metastatic pancreatic cancer (Stable disease: SD) and patients with progression due to reasons such as worsening of tumor size (Progressive disease: PD) (Table 1).
- The specific types of adverse events and the type and severity of specific adverse events in SD were defined according to CTCAE 5.06. Each scenario did not specify that the patient had pancreatic cancer to avoid bias due to the name of the disease. The content of the scenarios was expressed in five items: summary, physical symptoms (appetite, fatigue, body aches), daily life at home and outside, mental, and adverse effects.

PARTICIPANTS

- The inclusion criteria for the survey are as follows for both F2F and WEB. Survey participants were collected from the mechanism method for F2F and panel data for WEB.
- In February and March 2021, due to the spread of Covid-19, surveying people aged 65 years and older was not possible.
  - Aged 20 years and over (excluding healthcare professionals, including doctors, dentists, pharmacists and nurses)
  - Agree to informed content

Table 1 : List of health status scenario.

No	Health status		AE Grade
1	Stable disease	No adverse effects	-
2		Neutropenia	1/2
3		Neutropenia	3/4
4		FN	-
5		Diarrhea	1/2
6		Diarrhea	3/4
7		Nausea/Vomiting	1/2
8		Nausea/Vomiting	3/4
9		Neuropathy	1/2
10		Neuropathy	3/4
11	Progressive disease		-

QOL RESEARCH

- For both F2F and WEB, background information information (gender, age, employment status, education, marital status) and three example cTTO questions were answered. After that, the disease state scenario was answered by cTTO. The disease state scenarios were answered in 5 or all 11 scenarios. Finally, participants answered the following three questions answered on one of four levels (Strongly agree, Agree, Disagree, Strongly disagree).
  - ”I found it easy to imagine the scenarios I was asked”
  - “I found it easy to tell the difference between the lives I was asked to think about”
  - "I found it difficult to decide on my answers to the questions"

STATISTICAL ANALYSIS

- To assess the reliability of the responses, analyses were conducted with two populations: the Analysed Population (AP) and the High Engagement Population (HEP). AP was defined as those who responded to all questions, while HEP was defined as those who met the definition of AP and did not apply the following two additional exclusion criteria.
- The HEP population was defined as participants excluding the following.;
  - Participants who gave inconsistent responses to cTTO exercises 1 and 2.
  - Participants who responded to all scenarios with a QOL value = -1, 0, or 1.
- We The primary endpoint was utility for each scenario. Secondary endpoints were the consistency of cTTO exercises, the comprehension questionnaire, the number of tasks, the time per task to assess respondents' understanding and engagement.

Result

PARTICIPANTS POPULATION AND BACKGROUND

- AP (WEB: 541, F2F: 220) and HEP (WEB: 319, F2F: 201) were selected in all participants (WEB: 892, F2F: 220).
- The HEP criteria excluded 41.0% of participants from WEB-AP and 8.6% of participants from F2F-AP. Patient backgrounds of the two groups in AP did not differ significantly except for age and employment (Table 2).

Table 2 : Participant background

Characteristics	F2F-AP N	F2F-AP %	WEB-AP N	WEB-AP %	p-value
N	220	100%	541	100%	-
Gender					
Male	110	50.0%	269	49.7%	.9574
Female	110	50.0%	272	50.3%	
Age					
20-29	44	20.0%	90	16.6%	<.005
30-39	44	20.0%	89	16.5%	
40-49	44	20.0%	93	17.2%	
50-59	44	20.0%	90	16.6%	
60-64	44	20.0%	52	9.6%	
65-	0	0.0%	127	23.5%	
Employment status					
Full-time employee	133	60.5%	185	34.2%	<.005
Temporary worker	13	5.9%	22	4.1%	
Part-time worker	28	12.7%	81	15.0%	
Self-employed	9	4.1%	40	7.4%	
Unemployed	22	10.0%	106	19.6%	
Retired	1	0.5%	74	13.7%	
Student	14	6.4%	25	4.6%	
Other	0	0.0%	8	1.5%	
Education					
Junior high school	1	0.5%	12	2.2%	.3428
Senior high school	55	25.0%	165	30.5%	
Vocational school / technical college	36	16.4%	47	8.7%	
Junior college	15	6.8%	59	10.9%	
University	104	47.3%	223	41.2%	
Master's Degree	9	4.1%	34	6.3%	
Other	0	0.0%	1	0.2%	
Marital status					
Unmarried	74	33.6%	201	37.2%	.7649
Married	131	59.5%	296	54.7%	
Other	15	6.8%	44	8.1%	

UNDERSTANDING OF THE SURVEY

- There were significant differences between the groups in their understanding of the survey responses in AP for all questions (Table 3).
- In F2F, more than 95% of the respondents answered "Strongly agree" or "agree" for the ease of imagining scenarios and differences, while only 80% of the respondents gave the same answers.

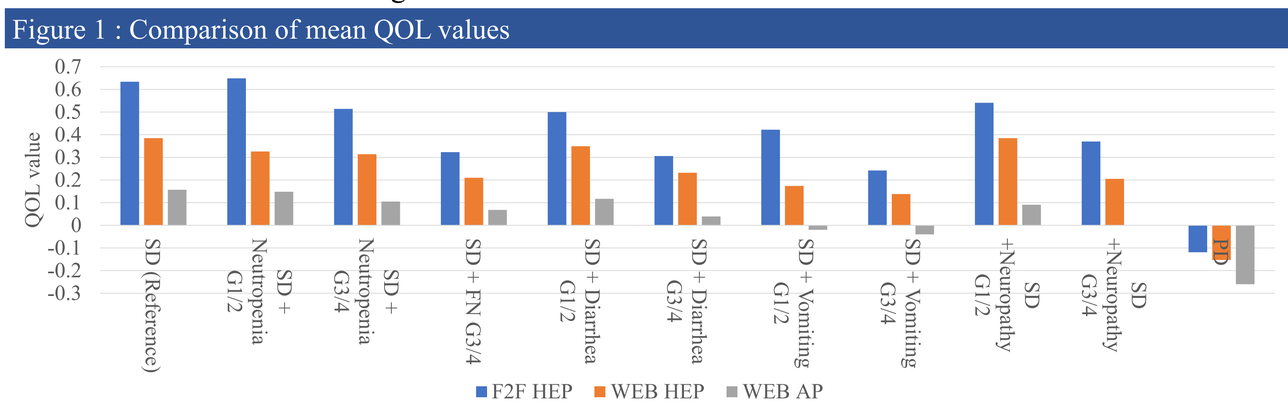
Table 3 : Three comprehension questionnaires

Questionnaire	F2F-AP N	F2F-AP %	WEB-AP N	WEB-AP %	p-value
Q1 ”I found it easy to imagine the scenarios I was asked”					
Strongly agree	101	45.90%	73	13.50%	<.005
Agree	110	50.00%	354	65.40%	
Disagree	8	3.60%	88	16.30%	
Strongly disagree	1	0.50%	26	4.80%	
Q2 “I found it easy to tell the difference between the lives I was asked to think about”					
Strongly agree	147	66.80%	151	27.90%	<.005
Agree	71	32.30%	299	55.30%	
Disagree	2	0.90%	78	14.40%	
Strongly disagree	0	0.00%	13	2.40%	
Q3 "I found it difficult to decide on my answers to the questions"					
Strongly agree	57	25.90%	82	15.20%	<.005
Agree	117	53.20%	257	47.50%	
Disagree	44	20.00%	169	31.20%	
Strongly disagree	2	0.90%	33	6.10%	

QOL VALUES

- QOL values per scenarios for WEB-AP/HEP trended to be lower than for F2F-HEP(Figure 1).
- QOL value for PD were worse than death (WTD) in all population. In WEP-AP, the QOL value was WTD even in SD + Vomiting Grade 1/2.

Figure 1 : Comparison of mean QOL values



URELIABILITY OF ANSWERS

- Despite several exclusion criteria related to comprehension, the results showed that the WEB-HEP differed significantly from the F2F-HEP on all items except ‘Times of Trade-offs’ (Table 4).

Table 4 : Comparison of response preferences and task preferences among participants

Level		F2F-HEP		WEB-HEP		p-value
Participants (N)			201		319	-
Tasks (N)			1827		1595	-
QOL = -1 (N, %)		90	4.90%	139	8.70%	<.005
QOL = 0 (N, %)		238	13.00%	279	17.50%	
QOL = 1 (N, %)		3	0.20%	100	6.30%	
Participants evaluated both SD and PD scenarios (N)			201		51	-
QOL value of PD > SD (N, %)		1	0.50%	8	15.70%	<.005
QOL value of PD > SD (N, %)		1	0.50%	8	15.70%	<.005
Time per task in seconds (Median, IQR)		94	(74-125)	47	(31-74)	<.005
Times of Trade-offs	(Median, IQR)	5.28	1.96	5.19	2.39	.4137

Discussion

- We attributed the differences between F2F and WEB to a lack of understanding of cTTO and a low engagement of respondents. So, we set up exclusion criteria for HEP.
- Although more patients in WEB-AP than in F2F-AP answered 'Strongly disagree' or 'Disagree' in the comprehension questionnaire, 41.0% of respondents were excluded in WEB-HEP, suggesting that many respondents with insufficient comprehension or engagement were excluded.
- By adopting the exclusion criteria of HEP, 41.0% of respondents were excluded in the WEB-HEP. Therefore, we suggest that this response excluded many respondents who lacked understanding or engagement.
- However, while the results of VBM survey using WEB did not always match the F2F results, there were no QOL values that were difficult to interpret across scenarios, regardless of the methodology. We suggest that although WEB has a certain number of respondents who lack understanding of the survey, low engagement with the responses may have a greater impact.
- In addition, even after adopting the exclusion criteria for HEP, the Disutility of WEB-HEP was greater than F2F-HEP in all scenarios. Therefore, we considered that the WEB tended to have systematically greater disutility than F2F, as well as other factors.
- Particularly, the comparison results for reliability assessment categories other than the number of trade-offs in HEP responses are significantly different, suggesting that the lack of understanding of the survey and low engagement of respondents may not have been completely removed.

Conclusion

- This finding suggested that poor understanding of cTTO and unreliable responses among the general population may cause differences between two methods. However, in addition to these factors, it was also possible that QOL values of WEB could have systematic differences with F2F.
- Further studies are required to improve quality and reliability of online survey.

Example : cTTO question screen (PC platform)

QX You will be asked to think about the "Full health" and the "Impaired health" shown below. After reading all the statements on the screen, imagine how you would feel if you were in such a health condition.

		Full health	Impaired health
Summary		Physically and mentally, the healthiest state.	You have a life-threatening disease, but his condition has been stabilized by treatment.
Physical symptoms	Appetite	You have the same appetite as usual.	You do not have enough appetite to lose weight.
	Fatigue	You can eating as usual.	You are more tired than whe you was healthy.
	Body aches	You have not pain.	Sometimes you have strong pain. You take medication to relieve it.
Daily life at home and outside		You can live freely on your own.	You can live by yourself at home, but you can only go out for a couple of hours.
Mental		You have no worries or concerns about your health.	You are very anxious about the possibility of dying from the disease.
Adverse effects		None.	Due to the side effects of the treatment, you have persistent tingling pain and numbness in your hands and feet, which is uncomfortable.

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