Knowledge, Attitudes, and Practices in Colorectal Cancer Screening in the Philippines

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ABSTRACT

Background and Objective. Colorectal cancer (CRC) has the third highest incidence in the Philippines. Currently, there is a paucity in literature that is focused on the knowledge, attitudes, and perceptions of Filipinos regarding CRC screening. This is the first study in the Philippines that describes this.

Methods. This is a cross-sectional study that validated a 52-item Filipino questionnaire on the knowledge on colorectal cancer, willingness to undergo CRC screening, and perceived benefits and barriers to fecal occult blood test (FOBT) and colonoscopy. The study enrolled household heads more than 20 years of age residing in both urban and rural communities in the Philippines.

Results. The UP-PGH CRC KAP (University of the Philippines – Philippine General Hospital Colorectal Cancer Knowledge, Attitudes, and Practices) and Rawl Questionnaire's validity and internal consistency were established in a pilot study of 30 respondents. A total of 288 respondents were then enrolled to the main study group with a median age of 54.0. Knowledge scores for prognosis and utility of CRC screening were modest (6.3/12 and 8.4/20, respectively). Perceived benefit scores to FOBT and colonoscopy were high (9.9/12 and 13.9/16, respectively). Median scores to barriers to FOBT and colonoscopy were intermediate (22.5/36 and 35.8/60, respectively). Notably, a vast majority (86.1%) were willing to participate in CRC screening programs initiated by the government, and 46.9% agreed to undergo screening tests even as out-of-pocket expense.

Conclusion. The UP-PGH CRC KAP Questionnaire as well as the Filipino translation of the Rawl Questionnaire are reliable and valid tools in extensively assessing the knowledge of Filipinos on CRC and willingness to undergo screening, as well as the benefits of and barriers to FOBT and colonoscopy. Knowledge scores were modest suggesting that directed educational campaigns and awareness programs can aid in increasing awareness about CRC and its screening. Household income and highest educational attainment were significantly positively correlated with knowledge scores, and perceived benefits of and barriers to CRC screening. Scores were generally comparable between urban and rural communities.

Keywords: colorectal cancer screening, Knowledge Attitudes Practices (KAP), FOBT and colonoscopy, patient education

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INTRODUCTION

Colorectal cancer (CRC) has the third highest incidence among all malignancies affecting Filipinos following breast and lung cancer, and subsequently accounted for 9,091 cancer-related deaths (ranked 4th) in the Philippines in 2020.[1,2] Colorectal cancer is a preventable and curable disease in the early stages. Screening allows the detection and removal of premalignant precursor lesions before their progression to cancer, thereby reducing incidence and mortality. Two

large prospective observational studies enrolling a total of 436,927 patients, showed that people who reported at least one screening colonoscopy had a reduction of CRC-specific mortality rate by almost 70% compared to those who never had screening colonoscopy.[3,4] Screening for CRC leads allows detection of early disease which has better prognosis in terms of survival and recurrence rates. Detection of CRC at early stages (no lymph node involvement) confers a 5-year survival rate approaching 90%, which decreases to 70.4% with the involvement of lymph nodes. Metastatic disease has a dismal 5-year survival rate of 12.5%.[5,6] These information strengthens the importance of CRC screening.

There are several CRC screening modalities available including colonoscopy, fecal immunochemical test (FIT), CT colonography, sigmoidoscopy, guaiac-based fecal occult blood testing (gFOBT), and multitargeted stool DNA testing (FIT-DNA). Several microsimulation models have demonstrated a similar mortality benefit across all modalities.[7,8] Although these are all acceptable modalities of CRC screening, colonoscopy has the highest specificity and sensitivity, and confers the highest reduction in mortality among these tests (87-97% reduction among patients aged 45-85 screened every 5 years).[9]

Despite the evidence outlining the benefits of early detection and prevention, there is currently no formal CRC screening program in the Philippines and most health facilities which offer colonoscopy are found in urban areas. The absence of a formalized program has led to low CRC screening participation and higher mortality and morbidity of CRC in the Philippines. This is a multifaceted problem in which cost and access to healthcare services certainly play a significant role.[10,11]

Identifying the motivation of people to participate and practice preventive health behaviors, which includes cancer screening, is important to increase uptake for screening programs. The health belief model posited by Rosenstock is a useful framework to understand the knowledge, attitudes, and perceptions surrounding CRC screening and is reflected in a validated questionnaire by Rawl et al. on CRC screening.[12,13] This model aims to measure the perceived disease susceptibility and severity among participants and can predict screening behavior by measuring participants' self-efficacy and perceived benefits of and barriers to screening. It also takes into account the societal/community factors that affect screening rates and by doing so, the health belief model attempts to identify targetable and actionable factors that can inform community health interventions and improve screening behavior. The validated questionnaire by Rawl which was grounded on these principles, sought to understand perceived benefits and barrier to CRC screening, particularly FOBT and colonoscopy.

Currently, there is a paucity in literature that is focused on the knowledge, attitudes, and perceptions of Filipinos regarding CRC screening. Describing these is essential in understanding the relatively low screening rates among Filipinos and in planning interventions to increase screening rates for colorectal malignancies in the country. Improving screening rates is expected to decrease the burden of CRC in the Philippines.

OBJECTIVES

General Objective

To determine the awareness, knowledge, attitudes, and perceptions of CRC screening among participants in both urban and rural communities in the Philippines.[14]

Specific Objectives:

1. To validate a Filipino translation of the questionnaire on barriers to CRC screening by Dr. Susan Rawl entitled "Instruments to measure colorectal cancer screening benefits and barriers"
2. To assess the baseline awareness, knowledge of, attitudes toward, and perception of CRC using the Filipino translation of the questionnaire with added questions constructed by the investigators to further describe barriers to CRC in the Philippines
3. To identify which sociodemographic factors are associated with barriers to screening, including household income bracket (Appendix A)
4. To compare differences in awareness, knowledge, attitudes, and practices between households belonging to urban and rural communities

Significance of the Study

This study is the first in the Philippines to validate and use a Filipino translation of a validated English questionnaire on barriers and benefits to CRC screening. This study is also the first to describe the knowledge of Filipinos on prognosis of CRC and utility of its screening. This allowed the identification of potential targets of intervention to increase participation and adherence to CRC screening, with the ultimate goal of improving outcomes and decreasing the burden of colorectal malignancies in the Philippines.

METHODS

Study Design, Study Sites, Sampling, and Sample Size

This was a cross-sectional study that determined the awareness, knowledge, and attitudes of Filipinos by administering a questionnaire to household heads from urban (Metro Manila – Quezon City and Manila) and rural (Bulacan, Laguna, Cavite, and Pampanga) areas in the Philippines. Household visits and recruitment by the investigators and field enumerators were done in January–March 2023. A community was defined as urban if they meet the operational definition set by the Philippines Statistics Authority (Appendix B), otherwise, will be classified as rural.

Purposive sampling of the households was conducted. The head of the household will be included in the study if

they are more than 20 years of age and are willing to undergo the informed consent process. The head of the household is an adult person, male or female, who is responsible for the organization and care of the household or who is regarded as such by the members of the household.[15] The head of the household was assumed to be primarily concerned about the health of the family. After securing the signed informed consent, the questionnaire was then administered accordingly.

The sample size used in the validation phase of the questionnaires was based on the suggestions by Bujang et al.[16] With the shortest set of items at three (3), and considering α =.05 and power of at least 80%, the recommendation was to use at least n = 52 for moderate effect size and at least n = 19 for large effect size when testing for the internal consistency of the items using Cronbach's alpha. As the main study utilized convenience sampling and generalizations to a larger population were not done, computation of sample size based on formal statistical estimation theory for sample size determination is not applicable.[17] However, a quota of at least 75 respondents each for urban and rural settings was employed.

Questionnaire Development and Validation of Filipino Translation

The first phase of the study was the validation of the Filipino translation of the original and validated questionnaire developed by Dr. Susan Rawl entitled "Instruments to measure colorectal cancer screening benefits and barriers." The English questionnaire, which was initially validated in 2001 and updated in 2015, was secured through personal communication. Forward translation to Filipino and back translation to English was done by reputable institutions of the University of the Philippines. The Filipino Translation of the Rawl Questionnaire was then incorporated to another set of KAP questions drafted by the authors, which will be collectively called the UP-PGH CRC KAP Questionnaire. An expert committee composed of the investigators, the translators, and a methodologist then constructed the pre-final questionnaire which was subjected to a pilot testing of 30 participants in Quezon City, which also clarified items that could be misleading. The pilot testing was then followed by the validation process in which reliability, consistency, and validity were analyzed. Final changes were made on the translated questionnaire as deemed necessary by the expert panel. The final items included in the questionnaire can be seen in Appendix C.

Data and Statistical Analysis Plan

The collected data was encoded in a spreadsheet for subsequent analysis. Items related to knowledge assessment were scored, with "Don't Know", "Refused", "Strongly Disagree" or "Disagree" marked as 0, while "Agree" and "Strongly Agree" were marked as 1 and 2, respectively. Negatively-stated statements were reversed-scored prior to the computation of total scores. Similarly, scoring was applied to the Filipino translation of the Rawl questionnaire, with "Strongly Disagree" up to "Strongly Agree" marked with scores from 1 to 4, accordingly.

Statistical analysis of the data was done using SPSS (version 21 or higher). Frequency counts and percentages were generated for qualitative variables while means, standard deviations, minima, and maxima were computed for quantitative variables. These summary statistics aided in determining the demographic profile of the respondents, and the baseline level of awareness, knowledge of, attitudes toward, and perception of CRC. Wilcoxon rank sum test or Kruskal-Wallis test were used to explore the relationship between a quantitative variable and a qualitative variable, chi-square test for independence was used to test for the association between two nominal variables, while the spearman rank-order correlation was used to measure the strength of and test the association between two ordinal or quantitative variables.

Ethical Considerations

All participants were asked to sign an informed consent to be included in the study and subsequently advised that benefits from the collective information provided by all participants will greatly aid in understanding and improving CRC screening practices in the Philippines. Participants could refuse to join or withdraw from the study at any time for whatever reason. All information provided by the participating households, including their name, age, and contact numbers, were kept confidential and participants were accordingly assigned to unique alphanumerical case identifiers upon encoding into the dataset (de-identification and use of coded data).

RESULTS

Pilot Study

Validation of the Filipino Questionnaire

Validation of the Filipino version of the questionnaire was done by administering it to 50 respondents, with an equal split among urban and rural residents. Around two-thirds of the respondents (66.00%) were males, and roughly the same percentage (68.0%) were married. The mean age of the respondents was 49.9 years old, with the youngest at 24 years and the oldest at 75 years. More than half of them (58.0%) were at most high school graduates and 18 (36%) were able to graduate from college. Lastly, the majority of the pilot study respondents (64.0%) belong in the less than PhP 25,000 per month household income bracket. Demographic profiles of pilot study participants are shown in Table 1.

Cronbach's alpha was used to evaluate the internal consistency of the scales used to assess the respondents' knowledge about and attitudes towards CRC and colorectal cancer screening. Cronbach's alpha for the knowledge scales indicated acceptable internal consistency at 0.584 and 0.678 for the two parts, respectively. Meanwhile, the Filipino

Table 1. Demographic Profile of Pilot Study Respondents

Demographic Variable	n	%
Area Classification		
Urban	25	50.00
Rural	25	50.00
Sex		
Male	17	34.00
Female	33	66.00
Age	49.88 (SD = 12.09)	
Highest Educational Attainment		
No schooling	0	0.00
Elementary level	4	8.00
Elementary graduate	2	4.00
High School level	8	16.00
High School graduate	15	30.00
College level	3	6.00
College graduate	13	26.00
Post-graduate	5	10.00
Average Monthly Household Income (PhP)		
Less than 25,000	32	64.00
25,000 - 140,000	12	24.00
More than 140,000	6	12.00

translation of the questionnaire on benefits and barriers to colorectal cancer screening developed by Dr. Susan Rawl in 2013 was found to also have acceptable internal consistency. Specifically, the scales to measure the benefits of fecal occult blood test and the barriers to fecal occult blood test yielded Cronbach's alpha value of 0.879 and 0.737, respectively while the scales to measure the benefits of colonoscopy and barriers to colonoscopy registered Cronbach's alpha value of 0.913 and 0.901, respectively.

Main Study

Re-validation of the questionnaire

To ascertain the results of the pilot study, the internal consistency of the scales are used to measure the knowledge about and attitudes towards CRC and its screening. Cronbach's alpha for the knowledge scales (views about CRC and knowledge about factors and conditions leading to CRC) still indicated acceptable internal consistency at 0.617 and 0.590, respectively. Moreover, the scales to measure the benefits of fecal occult blood test and the barriers to fecal occult blood test yielded Cronbach's alpha value of 0.628 and 0.679, respectively while the scales to measure the benefits of colonoscopy and barriers to colonoscopy registered Cronbach's alpha value of 0.869 and 0.841, respectively. These confirm the results of the validation done from the pilot study indicating the favorable internal consistency of the scales.

Demographic Profile

The validated Filipino questionnaire was administered to 288 respondents for the main study, with the majority (84.03%) administered via face-to-face interview. The mean

Table 2. Demographic Profile of Main Study Respondents

Demographic Variable (N = 288)	n	%
Mode of Survey Administration		
Administered via face-to-face interview	242	84.03
Administered via telephone call	23	7.99
Self-administered	23	7.99
Location/Area		
Quezon City	72	25.00
Manila	2	0.69
Bulacan	60	20.83
Pampanga	76	26.39
Cavite	10	3.47
Laguna	68	23.61
Area Classification		
Urban	184	63.89
Rural	104	36.11
Age Group		
20-29	8	2.78
30-39	19	6.60
40-49	71	24.65
50-59	92	31.94
60-69	79	27.43
70 and above	19	6.60
Sex		
Male	121	42.01
Female	167	57.99
Marital Status		
Single	39	13.54
Married	191	66.32
Separated	20	6.94
Widowed	38	13.19
Highest Educational Attainment		
No schooling	1	0.35
Elementary level	11	3.82
Elementary graduate	33	11.46
High school level	26	9.03
High school graduate	69	23.96
College level	42	14.58
Vocational	15	5.21
College graduate	75	26.04
Post-graduate	16	5.56
Average Monthly Household Income (PhP)		
Less than 25,000	135	46.88
25,000 – 140,000	118	40.97
More than 140,000	35	12.15

age of the main study group was 54.0 (SD = 11.42) with 228 respondents (79.2%) having ages between 45-75 years, in whom CRC is recommended.[18] Close to two-thirds of the respondents (63.89%) were urban residents, and almost the same percentage were aged 50 years old and above, and were married (65.97% and 66.32%, respectively). Percentage of female study participants (57.99%) was marginally higher compared to male study participants. In terms of educational attainment, a little under half of the respondents (46.18%) reached at least college level. With respect to

average household monthly income, a little under half of the respondents (46.88%) have less than PhP 25,000. This was closely followed by those with average monthly income of PhP 25,000 up to PhP 140,000 (40.97%), with the remaining minority (12.15%) having an average monthly income of more than PhP 140,000. Demographic profiles of main study participants are shown in Table 2.

Additionally, almost two-thirds of the study participants (65.63%) reported no history of cancer in their family. Among those with a history of cancer, the three most common types were breast cancer (12.50%), CRC (7.99%), and liver cancer (5.21%).

Willingness to Undergo Cancer Screening

Respondents reported their willingness to participate in cancer screening programs of the government, with a vast majority agreeing (86.11%) to the statement. Notably, almost half of the respondents (46.88%) indicated agreement to undergo a screening test for CRC even as out-of- pocket expense. When asked about the amount they are willing to spend yearly for CRC screening, 185 respondents provided an answer. Seventy of them said that they are not willing to spend any amount for CRC screening. Of the 115 respondents who gave a non-zero value, the median yearly amount they are willing to spend was PhP 3,000 (*SD* = PhP 7,151), with a minimum amount of PhP 100 and a maximum amount of PhP 50,000. Expectedly, the median amount that the respondents are willing to spend for CRC screening increases as their average monthly income increases. Specifically, respondents with average monthly income less than PhP 25,000 were willing to spend a median amount of PhP 2,000 per year, increasing to PhP 3,000 for those with average monthly income of PhP 25,000 to PhP 140,000 and to PhP 5,000 for those with average monthly income higher than PhP 140,000.

Knowledge on Colorectal Cancer

Table 3 shows the distribution of responses on items pertaining to prognosis and implications of screening for CRC. The results show two statements that were lagging in terms of the knowledge of the respondents: "There are available colorectal cancer screening tests in the Philippines" and "Colorectal cancer can be detected even without the onset of symptoms." On average, the respondents scored 6.32 points on this scale out of the maximum of 12 points. Hence, the average knowledge on prognosis and implications of screening for CRC barely exceeded the midpoint score of 6 points.

Considering the risk factors leading to CRC, Table 4 shows the aggregated percentage of respondents who agreed and strongly agreed. The percentage rating is indicative of the correct knowledge of the respondents about the factors that lead to CRC. Notably, only 73% and 50% of respondents were able to identify "*Smoking*" and *"Older Age,"* respectively, as risk factors for developing CRC. Two nuisance factors (hepatitis and use of illicit drugs) surfaced as bottom-2 statements. Mean total score for this scale was 8.37 points out of the maximum 20 points, more than a point below the midpoint score of 10 points. This implies that although the other statements reflect the respondent's substantial knowledge about the factors leading to CRC except for *"Older Age,"* there seems to be an indication that they were unable to filter out nuisance factors that do not directly lead to CRC.

Benefits and Barriers to Colorectal Cancer Screening

The validated Filipino-translation of the questionnaire developed by Dr. Susan Rawl in 2013 was used to gauge the barriers and benefits to CRC screening among the respondents.

Table 5 presents the distribution of responses per item under benefits from FOBT. All the three items registered high agreement among the respondents, with almost 90% of them agreeing or strongly agreeing with the statements. The computed mean total score for FOBT benefits was 9.91 (n = 266, SD = 1.59), which is close to the maximum score of 12 indicating that all respondents perceived that they would benefit from undergoing FOBT.

Table 3. Percentage of Responses to Knowledge Items Focused on Prognosis of CRC and Utility of its Screening with Corresponding Points

Statement	No point				One point	Two points
	Don't Know	Refused	Strongly Disagree	Disagree	Agree	Strongly Agree
Individuals should be screened for colorectal cancer if they have risks for developing it	1.74	1.04	0.35	1.39	51.04	44.44
Colorectal cancer can be fatal if detected late	1.74	0.69	2.08	1.04	35.07	59.38
Screening tests for colorectal cancer have been proven to prolong survival	10.07	3.82	1.04	3.82	53.47	27.78
Colorectal cancer is a curable condition if detected early	11.11	1.39	5.90	7.29	54.51	19.79
There are available colorectal cancer screening tests in the Philippines	33.33	0.35	1.74	5.90	39.24	19.44
Colorectal cancer can be detected even without the onset of symptoms	18.75	2.08	7.29	22.92	40.97	7.99

When it comes to barriers to FOBT, Table 6 shows the breakdown of responses per statement. The top 3 barriers to FOBT based on the percentage of respondents who agreed or strongly agreed to a statement were having no bowel problems or symptoms (78.82%), being worried about finding something wrong (48.96%) and financial implications or cost of the test (44.79%). The least common barriers to FOBT were being embarrassed and having no privacy to do it at home (9.03% and 9.72%, respectively). The mean total score for barriers to FOBT was 20.60 (n = 253, SD = 3.52). With possible scores ranging from 9 to 36 points, the mean total score is near the midpoint of 22.5, which indicates that on the average, the respondents' barriers to FOBT were relatively moderate.

With respect to perceived benefits to colonoscopy, Table 7 shows the breakdown of responses. Similar to the benefits of FOBT, almost all respondents answered positively (agree or strongly agree) to all statements (94.44% to 98.61%). Consequently, the computed mean total score for the benefits of colonoscopy was 13.93 (n = 273, SD = 1.88). With a maximum possible score of 16, the mean total score is indicative of the respondents' optimistic view of the benefits of colonoscopy.

Table 8 on the other hand describes the answers of the participants to possible barriers to colonoscopy. The two top barriers based on the percentage of respondents who agreed or strongly agreed to a statement were having no bowel problems or symptoms (76.74%) and the financial implications or costs of undergoing colonoscopy (71.88%). The least common barriers to colonoscopy as reported by the respondents were having to take the special medicine to clean out your bowel before the test would be hard (15.97%) and being embarrassed (15.97%). The mean total score for the barriers to colonoscopy was 35.78 (n = 198, SD = 6.71). With the range of possible scores of 15 to 60, the mean total score is just below the midrange value of 37.5, indicating that on the average, the respondents' barriers to colonoscopy were relatively moderate. Interesting to note that 65% of respondents 45 years and up disagreed with the barrier "You don't need one at your age."

In terms of the unaided and open-ended items in the questionnaire, only 35 out of 288 respondents (26 from urban and 9 from rural; 12.2%) respondents reported CRC as a tumor originating from the large intestines or rectum, while 84 (29.2%) reported is a disease involving the intestines or rectum. Only 45 (15.6%) knew about colonoscopy, and only 10 (3.5%) about stool tests as screening modalities for CRC. Moreover, only 2 (0.7%) respondents reported both as possible screening tools.

Comparison by Demographic Variables

Total scores on the knowledge scale and on the benefits and barriers to CRC screening scales were used to compare the respondents' level of knowledge about and attitude towards CRC screening across levels of the considered demographic variables. Table 9 summarizes the mean total scores for all the scales disaggregated by each demographic variable. Wilcoxon rank sum test and Kruskal-Wallis test

Table 4. Percentage of Responses to Knowledge Items on Risk Factors of CRC with Corresponding Points

Risk Factor	No point				One point	Two points
	Don't Know	Refused	Strongly Disagree	Disagree	Agree	Strongly Agree
Personal history of colorectal polyps and inflammation	5.90	1.04	2.78	3.47	63.54	23.26
Alcohol beverage intake	6.94	1.74	2.08	3.82	61.46	23.96
High intake of red meat	10.07	0.69	1.74	5.90	39.58	42.01
Obesity	12.50	1.39	1.74	9.72	53.82	20.83
Smoking	7.99	2.43	4.86	11.46	54.17	19.10
Multivitamin intake*	17.36	2.08	2.43	5.90	40.63	31.60
Family history of colorectal cancer	12.15	2.08	3.82	10.07	39.93	31.94
Older age	12.15	3.13	7.64	27.08	40.28	9.72
Illicit drug use*	17.36	2.43	18.40	45.83	10.76	5.21
Hepatitis infection*	25.00	2.43	12.50	46.18	10.07	3.82

**Nuisance items. Appropriate answers for these items are disagree and strongly disagree. Reverse-scored to reflect correct knowledge.*

Table 5. Percentage of responses to perceived benefits of doing FOBT

Statement	Don't Know	Refused	Strongly Disagree	Disagree	Agree	Strongly Agree
Doing regular stool blood tests...						
Will help you find colon cancer early	3.13	0.69	0.69	2.78	**55.90**	**36.81**
Will help you not worry as much about colon cancer	1.74	1.04	0.69	5.56	**61.81**	**29.17**
Will help lower your chances of dying from colon cancer	2.78	1.39	0.35	5.56	**56.25**	**33.68**

at the .05 level of significance were used to test differences in the central tendencies of the sub-groups for each of the six scales.

Analysis of responses revealed that the mean total scores for all scales were comparable across age groups, sex, marital status, and family history of CRC. When comparing rural and urban communities, the only statistically significant difference was in the barriers to FOBT with urban residents having higher scores (p = .01). In terms of benefits to FOBT and colonoscopy, there was a trend towards higher scores in urban areas but this was not significant. Mean knowledge scores about CRC in terms of prognosis, utility of screening and risks, FOBT, and colonoscopy benefits were found to significantly differ across highest educational attainment

Table 6. Percentage of Responses to Barriers to Undergoing FOBT

Statement	Don't Know	Refused	Strongly Disagree	Disagree	Agree	Strongly Agree
You might put off doing a stool blood test because…						
You don't have any bowel problems or symptoms	1.04	0.69	4.17	15.28	**45.49**	**33.33**
You worry about something finding wrong	0.69	0.35	9.38	40.63	**37.85**	**11.11**
The cost would be a problem	1.39	0.69	12.50	40.63	**31.94**	**12.85**
You don't have the time	1.39	2.78	6.94	51.04	**32.64**	**5.21**
It is not that important right now	0.69	1.74	15.97	51.74	**24.31**	**5.56**
You don't know how to do one	2.43	1.04	8.68	59.03	**23.96**	**4.86**
Collecting a stool sample is unpleasant	1.74	0.69	15.63	64.58	**13.89**	**3.47**
You don't have the privacy to do one at home	1.04	0.69	21.18	67.36	**8.68**	**1.04**
It is embarrassing	1.39	0.35	26.04	63.19	**6.94**	**2.08**

Table 7. Percentage of Responses to Benefits of Undergoing Colonoscopy

Statement	Don't Know	Refused	Strongly Disagree	Disagree	Agree	Strongly Agree
Having a colonoscopy…						
Will help you find colon cancer early	0.69	0.00	0.00	0.69	**40.63**	**57.99**
Will help you avoid getting colon cancer	1.74	1.04	0.35	2.43	**41.32**	**53.13**
Will lower your chances of dying from colon cancer	2.08	1.04	0.69	1.74	**50.00**	**44.44**
Will help you not worry as much about colon cancer	1.04	0.35	0.35	3.82	**53.13**	**41.32**

Table 8. Percentage of Responses to Barriers to Undergoing Colonoscopy

Statement	Don't Know	Refused	Strongly Disagree	Disagree	Agree	Strongly Agree
Maaaring mong ipagpaliban ang pagpapa-colonoscopy dahil…						
You don't have any bowel problems or symptoms	1.74	0.69	4.86	15.97	**46.88**	**29.86**
The cost would be a problem	3.82	1.39	7.99	14.93	**33.33**	**38.54**
Thinking about having one makes you feel nervous or jittery	1.74	0.69	5.56	38.54	**36.81**	**16.67**
You worry about something finding wrong	0.35	0.69	8.68	39.93	**34.38**	**15.97**
It could be painful	8.68	3.82	5.21	34.72	**36.11**	**11.46**
You don't understand what will be done	2.43	1.04	8.33	40.63	**41.32**	**6.25**
You would have to see a doctor you do not know	3.47	3.13	7.29	39.93	**38.54**	**7.64**
You are afraid that your colon could be injured	5.21	1.74	10.76	44.44	**29.86**	**7.99**
It is not that important right now	2.08	1.39	12.50	46.88	**30.56**	**6.60**
You don't have the time	1.04	2.78	7.29	53.47	**29.86**	**5.56**
You don't need one at your age	2.78	2.78	22.22	42.01	**22.22**	**7.99**
Having to find someone to drive you home would be hard	2.08	1.04	15.63	55.21	**21.88**	**4.17**
Having to limit what you eat before the test would be hard	1.74	0.35	19.44	59.03	**15.63**	**3.82**
Having to take the special medicine to clean out your bowel before the test would be hard	2.43	0.69	16.32	64.58	**12.85**	**3.13**
It is embarrassing	0.35	0.35	19.79	68.75	**9.03**	**1.74**

groups, with respondents who reached at least college level registering the highest mean score across the said scales. Furthermore, knowledge scores, FOBT benefits and barriers, and colonoscopy barriers were found to significantly differ across income groups. Specifically, respondents with average monthly income of more than PhP 140,000 (highest income group) yielded the highest mean score for views about CRC, knowledge of factors and conditions leading to CRC and FOBT benefits. On the contrary, respondents with average monthly income less than PhP 25,000 (lowest income group) scored the highest mean total score for both FOBT and colonoscopy barriers.

DISCUSSION

Validation of Filipino Questionnaire on Knowledge, Attitudes, and Practices on Colorectal Cancer Screening

This is the first study in the Philippines that validated a Filipino translation of a questionnaire that extensively reports on the knowledge, attitudes, and practices with regards CRC and its screening. Moreover, this study enrolled participants in urban and rural communities as well as those belonging in low-, middle-, and high-income households to generate data that will be more reflective of the general population.

Table 9. Association of Demographic Variables with Mean Total Scores on Knowledge About CRC as well as Benefits and Barriers to Undergoing FOBT and Colonoscopy

Demographic Variable	Mean Total Score					
	Prognosis and Utility of Screening	Risk Factors	FOBT Benefits	FOBT Barriers	Colonoscopy Benefits	Colonoscopy Barriers
Area Classification						
Urban	6.41	8.61	10.04	21.05	14.10	36.65
Rural	6.15	7.94	9.68	19.75	13.63	34.25
p-value	0.49	0.20	0.06	**0.01**	0.08	0.06
Age Group						
20-29	5.25	7.63	9.50	21.60	12.83	40.17
30-39	7.21	9.26	10.42	22.00	14.65	40.21
40-49	5.87	7.90	9.63	20.23	13.55	35.44
50-59	6.45	8.70	10.04	20.38	14.10	35.03
60-69	6.46	8.29	9.82	20.76	14.03	35.61
70 and above	6.37	8.32	10.17	20.47	13.79	34.42
p-value	0.18	0.54	0.32	0.75	0.17	0.21
Sex						
Male	6.47	8.74	9.96	20.39	14.11	35.57
Female	6.21	8.10	9.87	20.75	13.80	35.95
p-value	0.16	0.20	0.66	0.10	0.17	0.42
Marital Status						
Single	6.26	8.05	10.14	20.76	13.62	36.10
Married	6.34	8.40	9.96	20.51	13.96	35.57
Separated	6.40	8.90	9.89	21.33	14.37	38.85
Widowed	6.26	8.26	9.39	20.49	13.86	34.83
p-value	0.99	0.84	0.14	0.76	0.68	0.81
History of Colorectal Cancer						
No	6.26	8.26	9.88	20.56	13.91	35.82
Yes	6.96	9.61	10.24	21.00	14.13	35.37
p-value	0.12	0.08	0.28	0.86	0.55	0.71
Highest Educational Attainment						
At most elementary graduate	6.02	8.07	9.65	20.81	13.83	36.13
High school level, high school graduate, vocational	5.84	7.79	9.49	20.72	13.65	35.51
At least college level	6.82	8.95	10.33	20.41	14.20	35.87
p-value	**<.001**	**0.02**	**<.001**	0.19	**0.05**	0.83
Average Monthly Household Income (PhP)						
Less than 25,000	5.85	7.90	9.73	21.17	13.71	36.90
25,000 – 140,000	6.43	8.61	9.89	20.51	14.02	35.97
More than 140,000	7.74	9.37	10.60	18.63	14.47	31.37
p-value	**<.001**	**0.05**	**0.02**	**<.001**	0.08	**<.001**

The questionnaire is composed of 52 items that are divided into six sections. The first two sections include knowledge about CRC and willingness to undergo CRC screening which were added to the Filipino translation of Dr. Rawl's questionnaire, which has four sections on benefits of and barriers to FOBT and colonoscopy. The items on knowledge and willingness to undergo CRC screening were added based on the proficiency of the authors. Accordingly, the content of the items was checked and validated together with a clinical epidemiologist, acting as the expert panel given their expertise in the field of oncology. The pilot testing was very instrumental in making revisions in the format of the questionnaire as well as familiarization of the enumerators and investigators with the questionnaire and its administration. The internal consistency of all sections were acceptable, with Cronbach's alpha ranging from 0.584 to 0.879 in the pilot study and 0.590 to 0.869 in the main study group. There were no revisions made on the items included in the pilot study, as these were deemed essential and valid by the authors.

Knowledge, Attitudes, and Practices

Understanding the knowledge and perceptions of Filipinos about CRC as well as their attitudes and practices towards screening is not only important in planning and implementing screening programs, but also in tailoring the approach of clinicians to persuade the general population in undergoing screening tests. Findings of this study can therefore be used for directed educational campaigns to address the knowledge gap as well as to clarify misconceptions and overcome barriers to CRC screening with the overall goal of increasing participation rates in screening programs. Here, the knowledge scores on CRC prognosis and utility of screening, as well as risk factors were deemed modest (6.32/12 and 8.32/20, respectively). Only 12.2% of respondents were able to report CRC as tumors of the intestines or rectum and only 15.6% were initially aware of colonoscopy, which is deemed the gold standard for screening. In terms of perceived benefits to undergoing FOBT and colonoscopy, the obtained scores were very high reflecting a positive attitude to undergo such screening tests. This can be partly attributed to the fact that part of the questionnaire informed the participants about how these tests were conducted and could have changed their attitude towards these screening modalities. Another study done on Filipino participants residing in the United States also identified limited knowledge on CRC with healthcare access acting as a key determinant for screening.[19]

The barrier scores to FOBT and colonoscopy on the other hand were deemed as intermediate, being slightly lower than the midrange values in the respective scales. This reflects a significant apprehension of the general population to undergo these tests, but is believed by the authors to be an issue that can be addressed through educational campaigns and proper physician advice. Apprehensions due to costs of the tests, which was one of the most common perceived barriers in both FOBT and colonoscopy, was expected by the authors being in a low-middle income country. Educational attainment and household income were identified as factors affecting barrier scores, with those having higher educational attainment and higher household incomes having less apprehensions towards FOBT and colonoscopy. Moreover, these sociodemographic factors are also positively correlated with knowledge scores on CRC and benefit scores to FOBT and colonoscopy. Educational attainment has also been shown in other KAP studies on CRC screening to be positively correlated with knowledge scores on CRC screening.[19-21] We expected that the urban communities would have appreciably higher benefit scores and lower barrier scores, which reflect increased awareness about CRC and screening. Although there was a trend towards higher benefit scores on FOBT and colonoscopy in urban households, the only statistical significance seen was that urban households having higher barrier scores (higher apprehension) compared to rural households, which could have been an effect of the sampling method employed. A larger sample size recruited in a random fashion is needed to confirm this assumption. Nevertheless, it can be supposed that the location of the household only had a marginal impact on the obtained KAP scores.

Another positive finding of this study was that 86% of respondents were willing to participate in cancer screening programs of the government. This is almost the same with that of a study done in Jordan wherein 90% of respondents were willing to participate in government-funded screening programs.[22] Other studies report a much lower willingness rate of 37% - 52%.[20,23,24] Moreover, 47% of respondents in this study still agreed to undergo CRC screening even as an annual out-of-pocket expense, with a reported median value of PhP 2,000 - 5,000 (depending on the household income bracket). Potential out-of-pocket expenditure has also been identified as a barrier in another study done involving Filipino Americans.[25] This suggests that government-initiated programs and insurance subsidies of screening tests will likely play a role in increasing participation rates of the general public to CRC screening programs.

Limitations and Recommendations

Participants were secured through convenience sampling in order to increase participation rate and in consideration of the availability of BHWs who accompanied enumerators and investigators in conducting the survey. Having administered the survey in households near Local Health Centers, the scores could have been affected as these households might be more aware of health programs about cancer and screening tests. Moreover, this sampling method makes generalizability of the results questionable. Despite employing different strategies such as self-administration, or via phone call administration to increase the participation rate in light of the COVID-19 pandemic, there was still a limited number of surveyed households belonging to the high income bracket who were mostly unavailable or refused to answer at the time

of the survey. Moreover, there was also an uneven distribution of participants secured in the different study sites which can be attributed to approval of LGUs to conduct the survey and availability of BHWs to accompany the enumerators/ investigators. Administration of the questionnaire also took longer than expected (15-25 minutes, compared to the estimated 10 minutes) which could have greatly affected the number of participants interviewed on days of the survey. Although not documented, there were a lot of refusals to answer the questionnaire. The most common cited reasons for non-participation were the lack of time, unfamiliarity about the topic, and apprehension of answering incorrectly. These could have been addressed by providing incentives and conducting the survey on weekends.

CONCLUSION

The UP-PGH CRC KAP Questionnaire, including the Filipino translation of the Rawl Questionnaire, is a reliable and valid tool in extensively assessing the knowledge of Filipinos on CRC and willingness to undergo screening, as well as the benefits of and barriers to FOBT and colonoscopy. There was a positive attitude of respondents in terms of willingness to undergo CRC screening, as well as perceived benefits to both colonoscopy and FOBT. Knowledge scores about CRC in terms of prognosis and risk factors were less than half of the midrange of scores, reflecting the need to employ educational programs about CRC and its screening. Household income and highest educational attainment were significantly positively correlated with knowledge scores, and perceived benefits of and barriers to CRC screening. Urban and rural households generally had comparable scores proposing that the household location generally had a modest impact. Findings of this study can aid in directed educational campaigns and awareness programs to increase knowledge about CRC and its screening with the overall goal of improving CRC outcomes.

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Statement of Authorship

All authors certified fulfillment of ICMJE authorship criteria.

Author Disclosure

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APPENDICES

Appendix A. Income Groups in the Philippines *(Poverty, the Middle Class, and Income Distribution amid COVID-19, 2020)*

Income Group	Definition	Range of Monthly Family Incomes (for a Size of 5 members in 2018 prices)	Size of Income Group (i.e. Number of Households)	
			Number of Households	Number of Persons
Poor	Per capita income less than official poverty threshold	Less than PhP 10,957 per month	2.9 million	17.7 million
Low income (but not poor)	Per capita incomes between the poverty line and twice the poverty line	Between PhP 10,957 to PhP 21,914 per month	8.4 million	40.7 million
Lower middle income	Per capita incomes between twice the poverty line and four times the poverty line	Between PhP 21,914 to PhP 43,828 per month	7.6 million	31.0 million
Middle middle class	Per capita incomes between four times the poverty line and seven times the poverty line	Between PhP 43,828 to PhP 76,699 per month	3.1 million	11.2 million
Upper middle income	Per capita incomes between seven times the poverty line and twelve times the poverty line	Between PhP 76,699 to PhP 131,484 per month	1.2 million	3.8 million
Upper income (but not rich)	Per capita incomes between twelve times the poverty line and twenty times the poverty line	Between PhP 131,484 to PhP 219,140 per month	358 thousand	1.0 million
Rich	Per capita incomes at least equal to twenty times the poverty line	At least PhP 219,140	143 thousand	360 thousand

Appendix B. Operational Definition of Urban Areas in the Philippines *(Philippine Statistics Authority)*[17]

Qualifications to be an urban community:
1. If a barangay has a population size of 5,000 or more; or
2. If a barangay has at least one establishment with a minimum of 100 employees; or
3. If a barangay has 5 or more establishments with a minimum of 10 employees, and 5 or more facilities within the two-kilometer radius from the barangay hall

Additional definitions:
1. All barangays in the National Capital Region be automatically classified as urban;
2. All highly urbanized cities be subjected to the urban-rural criteria in order to determine its urban-rural classification;
3. The NSO adopt the recommended definition starting in the 2005 Census of Population (PopCen);
4. The NSO conduct parallel runs for generation of data on urban population using the old and new definitions in the 2005 PopCen; and
5. The NSO and NSCB spearhead the conduct of an advocacy campaign to inform users on the new definition of urban barangays.

Appendix C. English Version of the Questionnaire

Knowledge, Attitudes, and Practices in Colorectal Cancer Screening in the Philippines

Colorectal Cancer Screening Questionnaire

Profile

Case Identifier			
Barangay, Town/City, Region			
Contact Number *(if to be administered via phone call by participant preference)*			
Age		Sex:	☐ Male ☐ Female
Marital Status	☐ Single ☐ Married ☐ Separated ☐ Widow/er		
Family History of Cancer	☐ Colorectal Cancer ☐ Breast Cancer ☐ Lung cancer ☐ Liver Cancer ☐ Prostate Cancer ☐ None ☐ Others: _____		
Highest educational attainment	☐ Post-graduate ☐ College Graduate ☐ College Level ☐ High School graduate ☐ High School level ☐ Elementary graduate ☐ Elementary level ☐ No schooling		
Religion	☐ Roman Catholic ☐ Christian ☐ Muslim ☐ Others: _____		
Occupation	☐ Government ☐ Private Company ☐ Self-employed ☐ Others: _____		
Average Monthly Household Income (PhP)	☐ Less than 25,000 ☐ 25,000 – 140,000 ☐ More than 140,000		
Health plan and type of insurance	☐ Philhealth ☐ Private health insurance: _____ ☐ Health Maintenance Organization (HMO): _____ ☐ None		
Are you regularly being seen by a doctor?	☐ Yes ☐ No	If yes, how often? For what condition: If no, why? _____	
Alcohol Intake	☐ Yes ☐ No	If yes, how many glasses/bottles per week:	
Smoking History	☐ Yes ☐ No	If yes, how many sticks per day: Duration of smoking history in years:	
Do you exercise?	☐ Yes ☐ No	If yes, how many times per week? If no, why? _____	
What is your usual diet made of?	☐ More meat ☐ More vegetables ☐ Less meat/less vegetables ☐ More canned/preserved foods ☐ Less canned/ preserved foods ☐ Others, specify: _____		

Colorectal Cancer

Can you tell me in your own words what you think colorectal cancer is?

I'm going to read some statements on Colorectal Cancer. Please tell me how strongly you agree or disagree with each statement.

Instructions to the Interviewer: Do you agree or disagree after each statement?
If AGREE, follow up with: Do you agree or strongly agree? *If DISAGREE, follow up with:* Do you disagree or strongly disagree?

1 – Strongly Disagree	2 – Disagree	3 - Agree	4 – Strongly Agree	D – Don't know	R - Refused

1	Colorectal cancer is NOT a curable condition even if detected early	1	2	3	4	D	R
2	Colorectal cancer can be fatal if detected late	1	2	3	4	D	R
3	Colorectal Cancer can be detected even without symptoms	1	2	3	4	D	R
4	Individuals should be screened for colorectal cancer if they have risks for developing it	1	2	3	4	D	R
5	Screening tests for colorectal cancer have been proven to prolong survival	1	2	3	4	D	R
6	Screening tests for colorectal cancer are NOT available in the Philippines	1	2	3	4	D	R

What is/are the screening test/s for colorectal cancer that you know?
I'm going to read some factors and conditions. Please tell me how strongly you agree or disagree on each one leading to colorectal cancer.

1	Smoking	1	2	3	4	D	R
2	Alcohol beverage intake	1	2	3	4	D	R
3	Obesity	1	2	3	4	D	R
4	Illicit drug use	1	2	3	4	D	R
5	Hepatitis infection	1	2	3	4	D	R
6	Personal history of colorectal polyps and inflammation	1	2	3	4	D	R
7	Family history of colorectal cancer	1	2	3	4	D	R
8	Older age	1	2	3	4	D	R
9	High intake of red meat	1	2	3	4	D	R
10	Multivitamin intake	1	2	3	4	D	R

Based on current evidence, colorectal cancer screening can prolong survival. With that being stated…

1	I am willing to participate in cancer screening programs covered by the government	1	2	3	4	D	R
2	I am willing to undergo screening tests for colorectal cancer from out-of-pocket expenses	1	2	3	4	D	R
3	How much are you willing to spend <u>yearly</u> for colorectal cancer screening?	Php _____					

Instruments to measure colorectal cancer screening benefits and barriers
by Dr. Susan Rawl, 2013

Fecal Occult Blood Test Benefits
A Fecal Occult Blood Test is a test which checks if your stool has hidden blood in it. This test requires you to place a small sample of your stool on a special card that comes in a kit which is then sent to the laboratory for testing.

I'm going to read some statements about doing regular stool blood tests. Please tell me how strongly you agree or disagree with each statement.

Instructions to the Interviewer: Do you agree or disagree after each statement? *If AGREE, follow up with:* Do you agree or strongly agree? *If DISAGREE, follow up with:* Do you disagree or strongly disagree?

Doing regular stool blood tests…

1 – Strongly Disagree	2 – Disagree	3 - Agree	4 – Strongly Agree	D – Don't know	R - Refused

1	Will help you find colon cancer early	1	2	3	4	D	R
2	Will help lower your chances of dying from colon cancer	1	2	3	4	D	R
3	Will help you not worry as much about colon cancer	1	2	3	4	D	R

Scoring: Sum responses to items 1 through 3 to create the FOBT BENEFITS total score; range = 3-12. Higher score indicates greater perceived benefits of stool testing.

Fecal Occult Blood Test Barriers
I am going to read a list of reasons some people give for putting off doing a stool blood test. Please tell me how strongly you agree or disagree with each reason

Instructions to the Interviewer: Do you agree or disagree after each statement? *If AGREE, follow up with:* Do you agree or strongly agree? *If DISAGREE, follow up with:* Do you disagree or strongly disagree?

You might put off doing a stool blood test because…

1 – Strongly Disagree	2 – Disagree	3 - Agree	4 – Strongly Agree	D – Don't know	R - Refused

1	You worry about something finding wrong	1	2	3	4	D	R
2	It is embarrassing	1	2	3	4	D	R
3	You don't have the time	1	2	3	4	D	R
4	You don't know how to do one	1	2	3	4	D	R
5	Collecting a stool sample is unpleasant	1	2	3	4	D	R
6	The cost would be a problem	1	2	3	4	D	R
7	You don't have any bowel problems or symptoms	1	2	3	4	D	R
8	You don't have the privacy to do one at home	1	2	3	4	D	R
9	It is not that important right now	1	2	3	4	D	R

Scoring: Sum responses to items 1 through 9 to compute the FOBT BARRIERS total score; range = 9-36. Higher score indicates greater perceived barriers to stool testing (FOBT).

Colonoscopy Benefits

The next questions are about colonoscopy. A colonoscopy is a test where a doctor inserts a thin, flexible tube with a light into your rectum to examine your colon for any unusual growths. Right before the test, you get some medicine to help you relax.

The test usually takes 30 to 60 minutes, depending on whether there are growths or polyps that need to be removed. Afterward, you wait for the relaxing medicine to wear off, and someone has to drive you home.

I'm now going to read some statements about having a colonoscopy. Please tell me how strongly you agree or disagree with each statement.

Instructions to the Interviewer: Do you agree or disagree after each statement? *If AGREE, follow up with:* Do you agree or strongly agree? *If DISAGREE, follow up with:* Do you disagree or strongly disagree?

Having a colonoscopy…

1 – Strongly Disagree	2 – Disagree	3 - Agree	4 – Strongly Agree	D – Don't know	R - Refused

1	Will help you avoid getting colon cancer	1	2	3	4	D	R
2	Will help you find colon cancer early	1	2	3	4	D	R
3	Will lower your chances of dying from colon cancer	1	2	3	4	D	R
4	Will help you not worry as much about colon cancer	1	2	3	4	D	R

Scoring: Sum responses to items 1 through 4 to create the COLONOSCOPY BENEFITS total score; range = 4-16. Higher score indicates greater perceived benefits of colonoscopy.

Colonoscopy Barriers

I'm going to read a list of reasons some people give for putting off having a colonoscopy. Please tell me how strongly you agree or disagree with each reason.

Instructions to the Interviewer: Do you agree or disagree after each statement? *If AGREE, follow up with:* Do you agree or strongly agree? *If DISAGREE, follow up with:* Do you disagree or strongly disagree?

You might put off having a colonoscopy because…

1 – Strongly Disagree	2 – Disagree	3 - Agree	4 – Strongly Agree	D – Don't know	R - Refused

1	You worry about something finding wrong	1	2	3	4	D	R
2	It is embarrassing	1	2	3	4	D	R
3	You don't have the time	1	2	3	4	D	R
4	You don't understand what will be done	1	2	3	4	D	R
5	It could be painful	1	2	3	4	D	R
6	The cost would be a problem	1	2	3	4	D	R
7	You don't have any bowel problems or symptoms	1	2	3	4	D	R
8	Having to find someone to drive you home would be hard	1	2	3	4	D	R
9	Having to take the special medicine to clean out your bowel before the test would be hard	1	2	3	4	D	R
10	Having to limit what you eat before the test would be hard	1	2	3	4	D	R
11	You are afraid that your colon could be injured	1	2	3	4	D	R
12	It is not that important right now	1	2	3	4	D	R
13	Thinking about having one makes you feel nervous or jittery	1	2	3	4	D	R
14	You would have to see a doctor you do not know	1	2	3	4	D	R
15	You don't need one at your age	1	2	3	4	D	R

Scoring: Sum responses to items 1 through 15 to compute the COLONOSCOPY BARRIERS total score; range = 15-60. Higher score indicates greater perceived barriers to colonoscopy.