Awareness of Cancer Risk: Variation in Measurement Approaches

Abstract: Cancer is a major cause of morbidity and mortality. Diet, nutrition, physical inactivity, and obesity have been identified as important contributors to the increasing cancer incidence worldwide. To effectively plan interventions to reduce cancer incidence and to influence the public's decisions regarding health behaviors, it is important for professionals to have an understanding of the ways in which people understand risk with regard to development of cancer. Selecting an appropriate method to evaluate awareness of cancer risk is an important consideration. Quantitative approaches such as surveys may be used to investigate awareness of risk, and recall of risk factors as well as recognition of such factors may form part of such assessments. Such quantitative methods may be used to evaluate risk in different demographic groups, as well as to examine the link between risk factors and behavior. Qualitative approaches include in-depth interviews, focus groups, and open-ended survey items and may be used to explain findings derived using quantitative methods. Mixed methods approaches may also be employed, involving use of a survey as well as interviews or focus

groups to gather in-depth information. Assessment of awareness of cancer risk using an appropriate method has important implications for educators, as professionals must evaluate understanding of risk factors and tailor messages accordingly for educational programs. Ongoing evaluation of awareness is a key part of determining the effectiveness of education initiatives and identifying new and emerging issues.

Keywords: cancer, awareness, risk factors, quantitative research, qualitative research

typical of industrialized countries has led to a steady increase in the overall incidence rates of cancer.¹ Diet, nutrition, physical inactivity, and obesity have been identified as important contributors to the increasing cancer incidence worldwide.²

To effectively plan interventions to reduce cancer incidence and to influence the public's decisions regarding health behaviors, it is important for professionals to have an understanding of the ways in which people understand risk with regard to development of cancer. Awareness of risk is a key step in behavior change, as it is an important

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Cancer is a major cause of morbidity and mortality, with approximately 14 million new cases and 8 million cancer-related deaths in 2012.¹ The shift toward lifestyles

factor in influencing attitudes and intentions.^{3,4} Behavioral research in decision-making could improve efforts to decrease tobacco use, sun exposure, virus exposure, and controllable

DOI: 10.1177/1559827617746331. From the Department of Human Nutrition, Food and Animal Sciences, College of Tropical Agriculture and Human Resources, University of Hawaii at Manoa, Honolulu, Hawaii. Address correspondence to: Jinan Banna, PhD, RD, CDN, Department of Human Nutrition, Food and Animal Sciences, College of Tropical Agriculture and Human Resources, Agricultural Sciences 216, University of Hawaii at Manoa, 1955 East-West Road, Honolulu, HI 96822; e-mail: jcbanna@hawaii.edu.

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environmental exposures, as well as increase physical activity and healthy diets.⁵ There is a strong correlation between awareness of cancer risk factors and practicing the associated protective behaviors.⁶ However, low levels of understanding about the role of lifestyle factors in development of cancer have been reported.^{7,8} For example, participants in previous studies have reported low levels of awareness of leading cancer risk factors such as being overweight or obese, drinking alcohol, not eating enough vegetables, and not eating enough fruit.^{6,9,10} Despite significant investment in public cancer education, some previous studies have reported only marginally improving awareness of health-behavior cancer risk factors.¹¹ There is existing skepticism that cancer can be prevented, which serves as an obstacle to applying existing knowledge to combat cancer development.¹²

In investigating awareness of cancer risk, a number of different methods may be used, each yielding distinct types of information. Researchers conducting studies on this topic have identified the lack of uniform standards and methods for measuring awareness of cancer risk as a limitation in performing work in this area.⁹ Selecting an appropriate method to evaluate awareness is an important consideration for investigators examining this topic.

Approaches to Measurement of Awareness of Cancer Risk

Research investigating awareness of cancer risk has involved both quantitative (eg, surveys) and qualitative (eg, interviews) approaches. Studies using each of these approaches are described below.

Quantitative Approaches

Among quantitative approaches used to evaluate awareness of cancer risk is use of surveys. In a study of 122 058 females in Eastern China, data were collected based on a structured questionnaire that

captured knowledge of risk factors for breast cancer.⁹ For example, women were asked if they believed a high-fat diet to be related to development of breast cancer. All questions had multiple-choice responses, and the answer choices were categorized and quantified when possible to yield a cumulative score.

Similarly, in a study of 20 710 members of the public from 21 European countries, a survey was administered to evaluate colorectal cancer and its risk factors.¹³ Questions included 13 stem questions on facts, such as “Diets that are rich in fruit and vegetables reduce the risk of bowel cancer,” and respondents were asked to indicate whether the statements were true or false.

Another study conducted in university students in Jordan used both an open-ended question about colorectal cancer risk factors and a series of closed-ended questions about risk factors to assess level of agreement with these factors.¹⁰ The open-ended question aimed to assess how many risk factors students could recall unaided. The prompted risk factors were as follows: drinking alcohol, eating less than 5 portions of fruit and vegetables, eating red or processed meat, low fiber intake, being overweight, being over 70 years old, family history, physical inactivity, having other bowel disease, and having diabetes. Answers were assigned as strongly disagree, disagree, not sure, agree, and strongly agree.

A study performed in adult New Zealanders also used both recall and recognition to determine knowledge of cancer risk factors.¹⁴ Participants were first asked open-ended questions about their unprompted (recall) knowledge of cancer risk factors overall: “Do you believe there are things people can do to reduce their risk of cancer?” “What sort of things?” “How much do you think you can personally reduce your risk?” Respondents were then further prompted with a list of specific factors and asked if each were risk or protective factors for cancer (recognition), “Does [insert factor] increase, make no difference or decrease the risk of cancer?”

Qualitative Approaches

In-depth interviews have been used in some studies to investigate awareness of cancer risk. In a study in culturally diverse women in Vancouver, British Columbia, Canada, examining perspectives on nutrition, health, and breast cancer, each participant completed an in-depth individual interview, which was based on a semistructured interview guide that included questions about current and past eating habits; health status; beliefs about the relationships among diet, general health, and breast cancer risk; and sources of information about nutrition.¹⁵

Focus groups have also been used to gather information with regard to awareness of cancer risk. In a study of 38 foreign-born Chinese women in metropolitan Portland, Oregon, semistructured focus groups were conducted to explore beliefs related to breast cancer.¹⁶ Awareness of and knowledge about breast cancer risk was an area of focus in the interview guide, allowing for identification of many accurate and erroneous beliefs with regards to risk factors.

Other researchers have used open-ended survey items to qualitatively evaluate awareness of cancer risk. In a population-based survey of 1747 adults in the United Kingdom, awareness of lifestyle risk factors for cancer was assessed with 2 single items: “What do you think are the things that cause a person to develop cancer/heart disease or increase their chances of developing it?”¹⁷ Respondents were encouraged to list as many risk factors as they could.

Mixed Methods Approaches

In a study of 40 Saudi females aged 25 to 65 years focused on breast cancer awareness, a mixed study design of qualitative and quantitative approaches was used.¹⁸ Participants were first asked to complete a short questionnaire on basic knowledge about the risk of breast cancer, which included an item on the lifetime risk of healthy females of developing breast cancer. Focus group discussions were then conducted to

gather in-depth information on breast cancer risk.

Another study in Omani women also involved a quantitative survey and a qualitative component.¹⁹ In this study, the Breast Cancer Awareness Measure was used to evaluate awareness of risk factors. After the quantitative investigation, reasons for the numerical findings were determined through qualitative inquiry, which involved individual interviews, focus groups discussions, and follow-ups using WhatsApp and mobile technology.

Use of Diverse Measurement Approaches for Design of Cancer Prevention Initiatives

Qualitative approaches allow for gathering of detailed information with regard to participants' beliefs and experiences and seek to understand phenomena in uncontrolled, context-specific settings.²⁰ Qualitative researchers seek illumination, understanding, and extrapolation to similar situations.²⁰ With quantitative approaches, in contrast, findings are derived from standard statistical procedures and other means of quantification in pursuit of causal determination, prediction, and generalization of findings.²⁰

In evaluating awareness of cancer risk, qualitative methods make valuable contributions to the literature. Lee-Lin et al noted that a qualitative investigation of beliefs with regard to cancer risk may provide a basis for development of educational interventions.¹⁶ Qualitative methods may also be used to explain findings derived using quantitative methods, as Alkhasawneh et al noted.¹⁹

Quantitative approaches may be used to draw comparisons between different demographic groups with regard to awareness of cancer risks. Such approaches allow for use of statistical procedures to determine if certain segments of a population, such as those with higher income and levels of

education, have greater awareness of risk factors than others.⁶ Quantitative methods may also be used to determine the link between risk factors and associated behaviors in diverse groups. This information may then be used to determine the most appropriate groups to target in interventions. Audience segmentation for cancer prevention may be particularly important given the geographical and social differences in cancer awareness and related health outcomes.⁶ Analysis of the relationship between demographic characteristics, knowledge of cancer risk factors, and current behaviors may inform initiatives such as social marketing campaigns.⁶

Researchers have also noted the usefulness of both recall and recognition measures in evaluating awareness of cancer risk. A previous study revealed a discrepancy between levels of knowledge assessed using the 2 methods, indicating the need for careful consideration of the format of knowledge items.²¹ It has been suggested that recognition tasks provide more "lenient" measures of knowledge than unprompted recall tasks, as the questions may suggest what answer is correct and lead to guessing.²² Cognitive processes involved in recall are more complex than those involved in recognition of the correct responses.²¹

Assessment of awareness of cancer risk has important implications for educators, as professionals must evaluate understanding of risk factors and tailor messages accordingly for educational programs. Initiatives such as social marketing campaigns may draw on information regarding awareness of risk to address gaps in knowledge and dispel myths surrounding cancer risk factors.²³ Awareness of cancer risk is of significance if target groups perceive messages about behavior change to be relevant and respond to messages with even modest improvements in health behaviors.⁶ Ongoing evaluation of awareness is a key part of determining the effectiveness of education initiatives and identifying new and emerging issues.¹⁴

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