KAP on Cancer Immunotherapy as a Treatment Modality among Saudi Population

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Submission: Aug 19, 2023; Accepted: Nov 20, 2023;
Published: Nov 30, 2023

Abstract

Background: Cancer is a complex disease that involves multiple facets. Adjuvant attitudes can boost an individual's chances of long-term survival without rebound after the patient has had foremost therapy. Radiation therapy, and a combination of several treatment modalities. among myriad adjuvant therapies, such as adjuvant chemotherapy, in which medication specifically target and eradicate certain cancer cells.

Methods: To gain insight into the KAP on cancer immunotherapy as a therapeutic method among Saudi Arabian population, the research study deployed a cross-sectional survey. The questionnaire was administered in both Arabic and English. General parameters like the region of residence, age, gender, and work status were gathered for the metrics. For the purpose of analyzing the data, the

imported questionnaires were loaded into SPSS version 23.0, the Statistical Package for the Social Sciences.

Results: As Age increases, Attitude on Cancer Immunotherapy as treatment modality increases. Negative correlation exists between Age Group of study Participants and Knowledge Domain of KAP. As Age increases, Knowledge on Cancer Immunotherapy as treatment modality increases. Participants have fair knowledge on Cancer immutherapy as a treatment (40% and 44% respectively). No Significant correlation exist between Gender and KAP factor. Knowledge Domain (Male: P= 0.138 x2 =1.888, Female: P= 0.534 x2 = 1.768).

Conclusion: Cancer is a multifaceted illness that involves intricate changes to the body's physiological state. Looking for effective cancer treatment options is vital given the serious consequences of the disease. In light of the study's findings, we draw the conclusion that training health and human services personnel to implement gender-based initiatives centred on cancer treatment methods is essential.

Keywords: Immunotherapy, Cancer, Treatment, Survey and Analysis

INTRODUCTION

Cancer is a highly intricate assortment of ailments that entail an overall deficiency of control over advancement of cells and nurture across time [1]. In agreement with speculates from the World Health Organization (WHO) for 2019, cancer is the relating cause of death for people beneath the age of 70 in 112 out of 183 countries and ranks third or fourth in 23 further nations [2]. Cancer has emerged as a more common cause of death that in many nations, the mortality rates from stroke and coronary heart disease diminished enormously when as compared with cancer [3]. Cancer is a complex disease that involves multiple facets. It takes on by collaboration between the environment and various kinds of internal strategies, which comprises immune systems, hormones, and mutations [4]. Many traits that ranging from revolt to proliferation commands, hypocrisy to signals that cease cell division, unfettered replication, dodging apoptosis, persistent angiogenesis, and inevitably, metastasis—the propensity to move to other organs are symptomatic of cancer [5]. The microenvironment of benign tumors portrays

the extracellular environment and deregulation of several regulatory proteins, so it is critical in how to foster the growth and progression of malignancies [6]. Over time, it became unambiguous that deploying radiation and surgery as standalone cures for cancer is not as beneficial as combining them. Biological commodities, immunological-mediated therapy, and medications are now navigable as ways to heal [7]. The premise of radiation therapy is the incorporation of physical particles, such as protons, electrons, and other ions, to execute cancerous cells [8]. Ultra a great deal of radiation harm cells' genetic material, impedes cell division and safeguards them from propagating. Radiation therapy employs in this approach. If radiation treatment be used beforehand surgery, so as to diminish the magnitude of the tumor [9].

Reactive oxygen species emitted by chemotherapy drugs seek and eradicate tumor cells genotoxically in massive quantities [10]. However, the collateral harm that chemotherapy causes to wholesome cells may contribute to a myriad of dose-dependent undesirable consequences, such as nausea, vomiting, exhaustion, hair loss, and in catastrophic death [11]. One of the greatest potent therapies for cancer is gene therapy, which Astonishingly, with the use of stem cell treatment is growing far beyond regenerative medicine as more research emerges about stem cell development. With the intrusion of precisely orchestrated genes with curative properties into stem cells, tumor-seeking therapeutic transportation can be synthesized in-vitro [12]. For an extended period, cancer patients' chief treatment options remained radiation therapy, chemotherapy, and surgery, either independently or in tandem [13]. Even when these typical medications are used as band-aid approaches, there endures a gap in the cancer treatment paradigms that impedes patients from perish of their ailment. As a result, in order to rectify the deficiencies in the treatment techniques, cancer therapy must be sophisticated [14].

Adjuvant attitudes can boost an individual's chances of long-term survival without rebound after the patient has had foremost therapy. Radiation therapy, and a combination of several treatment modalities. among myriad adjuvant therapies, such as adjuvant chemotherapy, in which medication specifically target and eradicate certain cancer cells. Previous analysis proved that individuals with early-stage breast cancer may benefit from adjuvant chemotherapy

in refraining from cancer recurrence [15]. Adjuvant chemotherapy involving many medications is sometimes referred known as combination chemotherapy [16]. Hormonal treatment has therefore been established to be more effective in scenarios of epithelial cancer, encompassing breast carcinoma. The exponential growth of cancer is contingent on the immune system [17]. Cancer development or eradication can be impacted by both innate immune cells (myeloid progenitors) and adaptive immune cells (lymphoid progenitors) [6]. Cancer Immunotherapy, marketed as biological treatment or bio-therapy, boosts the immune system's response versus disease as a means to avert conditions like cancer. Numerous immunotherapies have been substantially tested, including monoclonal antibodies, cancer vaccines, and non-specific immunotherapies [18]. The tactics for cancer immunotherapy thrive by prompting the bodies immune system to concentrate on antigens displayed solely by cells that are cancer-causing, as opposed to cells of typical tissue [19]. In the event live bacteria were implemented as an immunological stimulant to treat cancer for the first time by William Coley in 1893, it became apparent that the immune system was able to detect and avert [20].

Cancer immunotherapy hasn't garnered a lot of scrutiny due to its tenuous effectiveness in clinical trials [10]. In 1909, Paul Ehrlich pioneered the notion of cancer immunotherapy, highlighting that antibodies have a knack to strike cancer cells directly [21]. The premise of immune surveillance was eventually put forth by Bur-net and Thomas in the 1950s. Pursuant to this view, cells that are cancerous are eradicated by the immune system from the cancer's root site before they can be suspected of being tumors [22]. Immunotherapy has lately disclosed good outcome for patients in multiple research investigations [23]. Recently, adjuvants and immunotherapies have been blended to formulate neo-adjuvant medicines. These therapies either mask immune system signals or boost convinced immune system cells.Cancer treatments, like native immune system reactions, are going to serve an enormous part in discerning cancerous cells from outside invaders. To do this, dealing with different immune pathways simultaneously can contribute to better clinical results [24]. Numerous forecasts pertaining to vaccine treatment have been made by scientists and researchers, claiming that it is more trustworthy than conventional methods of treatment. Through vaccination, the immune

system may mount a robust and long-lasting pursuit against cancer cells, insuring cancer patients' survival and hindering relapses [25]. A grasp on how cancer subverts the immune system has come a long way.

Methods

Participant Recruitment

To gain insight into the KAP on cancer immunotherapy as a therapeutic method among Saudi Arabian population, the research study deployed a cross-sectional survey. The individuals that took part were selected at random from distinct elements of the nation. Snowball sampling was used to choose a total of 25 respondents. The attendees in the research had to be at least eighteen years old and have lived in various regions of Saudi Arabia. Conversely, people under the age of eighteen and those who had just moved to Saudi Arabia were not allowed to participate in the survey.

Questionnaire

Part 1: The questionnaire, which had four sections, was administered in both Arabic and English. General parameters like the region of residence, age, gender, and work status were gathered for the metrics.

Part 2: Participants inquired questions on cancer immunotherapy as a cancer management treatment method in the Knowledge section. A right response was worth one point, and a wrong response was worth zero. After that, these scores were divided into two groups: high and low knowledge levels.

Section 3: Attitude: Participants' attitudes on the pros and drawbacks of cancer immunotherapy as a therapeutic approach were looked at. A higher rating suggested a more upbeat perspective on these subjects.

Section 4: Execution of strategies that boost participants' understanding and conviction about cancer immuno therapies as a therapeutic approach. Better practice is apparent by a higher score.

Statistical Analysis: For the purpose of analyzing the data, the imported questionnaires were loaded into SPSS version 23.0, the Statistical Package for the Social Sciences. The social and demographic information and KAP of the participants in cancer immunotherapy as a treatment modality in Saudi

Arabia were reviewed using the frequency percentage. Chi-square analyses were used for exploring demographic variables, including educational attainment. The association between dependent (KAP) and independent variables (age, gender, etc.) has been illustrated using scatter plots and box plots.

Ethical Consideration

Not applicable

Results

Figure 1: Participants' place of residence throughout KSA are highlighted on a map plot. Among 25 participants, Majority of them are from (Jeddah 7, 28%), followed by Al-Qassim (6, 24 %) and tiniest contribution from participants of Abha (5, 20%), Hafar Al-Batin (3, 12%) and Tabuk (2, 8%) respectively.

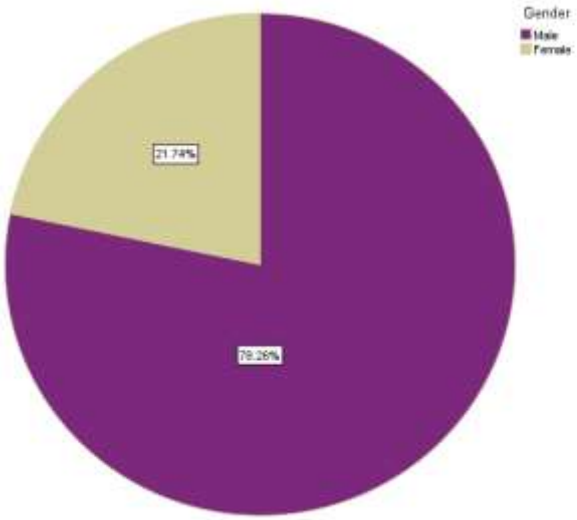

Figure 2: Illustrates the gender distribution of people participating in studies is illustrated There were 19.22% of male participants and 80.78% of female participants.

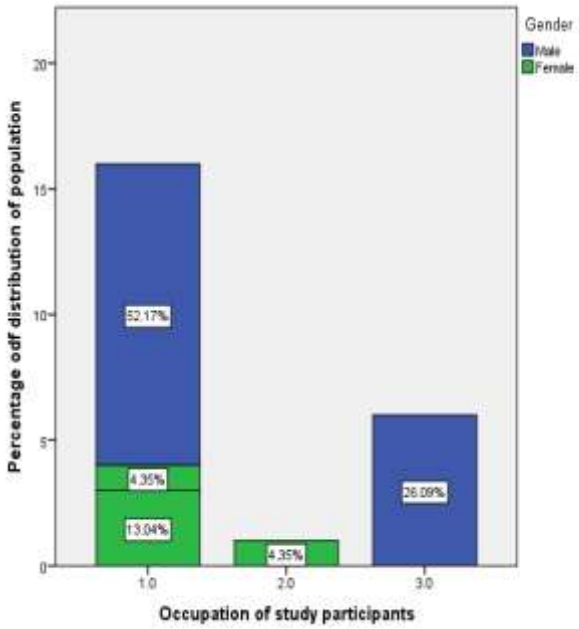

Figure 3: Stacked bar shows educational profile of study participants in accordance with Gender. Among Male population 52.17% were Pharmacist and 26.09%. Among Female Gender, 17.39% were Pharmacist and 4.35% were teachers. Score 1= Pharmacist, Score 2= Teachers and Score 3 = IT and other professionals.

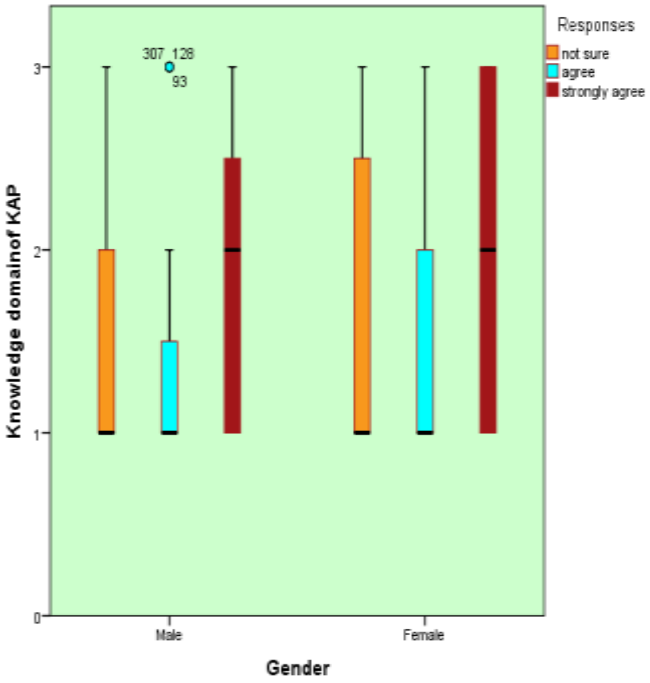

Figure 4: Box plot depicting agreement and disagreement in knowledge domain among gender. Among Female gender there is positive skewed distribution with median.

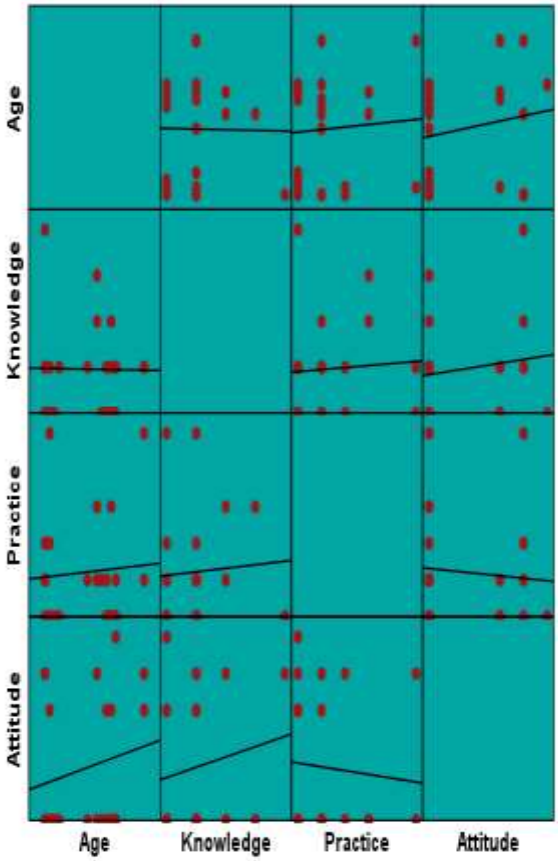

Figure 5: Scatter matrix plot depicting correlation between Knowledge, Attitude, Practice and Age of Study participants. Positive correlation exists between Age Group of study participants and Attitude Domain of KAP. As Age increases, Attitude on Cancer Immunotherapy as treatment modality increases. Negative correlation exists between Age Group of study Participants and Knowledge Domain of KAP. As Age increases, Knowledge on Cancer Immunotherapy as treatment modality increases.

Table 1: Response of participants to knowledge-based questions. Correct response graded 1 and Incorrect response graded 0. Mean score of responses were 44.6%. Score above 44.6% were considered to be high knowledge level. Participants have fair knowledge on Cancer immutherapy as a treatment (40% and 44% respectively).

KQ	Frequency (%) correct response	Frequency (%) Incorrect response
K1	10 (40%)	15 (60%)
K2	11 (44%)	14 (56%)

Table 2: Response of participants to Attitude based questions. Positive attitude is graded 1 and negative attitude is graded 0. Mean score of responses were 44%. Score above 44% were considered to positive attitude towards cancer immunotherapy and score below 44% were considered to be negative attitude. Participants have positive attitude for benefits of cancer immunotherapy as a treatment modality (64%).

AQ	Frequency (%) correct response	Frequency (%) Incorrect response
A1	16 (64%)	9 (36%)
A2	6 (24%)	19 (76%)

Table 3: Response of participants to practice based questions. A high score indicated improved practice. Mean score for responses were 48.2%. Score above 48.2% were considered to be good practice. Participants exhibited good practice towards believing Cancer Immunotherapy as a treatment modality in increasing survival rate of affected individuals

PQ	Frequency (%) correct response	Frequency (%) Incorrect response
P1	7 (28%)	18 (72%)
P2	17 (68%)	8 (32%)

Table 4: Depicts correlation between Gender and KAP factor. No Significant correlation exist between Gender and KAP factor. Knowledge Domain (Male: P= 0.138x2 =1.888, Female: P= 0.534x2 = 1.768).

Gender	Knowledge			Attitude			Practice		
	P value	X2	Likely hood ratio	P value	X2	Likely hood ratio	P value	X2	Likely hood ratio
Male	0.138	1.888	5.664	0.258	1.236	5.131	0.085	0.910	4.357
Female	0.534	1.768	5.304	0.809	0.140	4.959	0.367	2.348	4.610

Discussion

There is a scarcity of literature monitoring the utility of advanced cancer treatment modalities, notwithstanding an overwhelming number of studies measuring the advantages to patients from various curative modalities. Optimizing chemotherapy therapy regimens, lessening side effects and toxicity, rendering drug education and psychological support, optimizing patients' improvements and quality of life are just a few pros of advanced treatment. It is our hypothesis that even in the absence of thorough medication education, these patients got the chance to learn pertinent information from other sources, such as medical experts, friends, family, and, increasingly, the Internet. A polling instrument was used in this study to gauge participants' knowledge, attitudes and behaviors (KAP) on Cancer Immunotherapy as a treatment modality. In sharp contrast to other research carried out in Saudi Arabia (KSA), our study included a broad population from different locations and sectors. The aforementioned approach made it easier to find pertinent data on awareness of Saudi Arabia's population on Cancer Immunotherapy [26]. 78.26 percent of the participants were Male, and 21. 74 percent were Female. Among Male population 52.17% were Pharmacist and 26.09%. Among Female Gender, 17.39% were Pharmacist and 4.35% were teachers. In the existing study, Positive correlation exist between Age Group of study participants and Attitude Domain of KAP. As Age increases, Attitude on Cancer Immunotherapy as treatment modality increases. Negative correlation exists between Age Group of study Participants and Knowledge Domain of KAP. As Age increases, Knowledge on Cancer Immunotherapy as treatment modality increases. In a study by Al-querem et al, it was highlighted that survey takers more than 50 years old had better knowledge regarding cancer management options [27]. In the existing study. Participants have Positive attitude for Benefits of Cancer Immunotherapy as a treatment modality (64%) and 36% have negative attitude. Also, Participants have fair knowledge on Cancer immutherapy as a treatment (40% and 44% respectively).

Evidence from Australia, China, and Spain additionally reinforced people's dearth of understanding, which is contradicting with the current study [28-31]. It was pointed out that when participants' ages, educational levels, professional titles, and years of employment increased, their knowledge scores either considerably increased or articulated

an upward trend. In the same way, Wong discovered that being aware of cancer screening was negatively correlated with lower educational attainment [32]. Furthermore, a study was made on the correlation between the mean knowledge rank and the job title of the physician [33]. The disparity may be explained by population variability, disparities in socioeconomic background, and divergence in approach [34]. No Significant correlation exist between Gender and KAP factor in the present study. Due in part to the fact that male participants scored better on knowledge, male healthcare providers were more active than their female counterparts in spreading information about gastrointestinal cancer prevention and treatment. On the other hand, Wang and Lin found a favourable correlation between colorectal cancer screening and female gender [35]. The dispute described earlier may stem from disparate sociodemographic traits, local customs, and the structure of the survey. In a study by Vaidya, it was reported less cancer preventative activities, whereas women claimed more awareness of breast cancer. The misperception the conclusion that breast cancer only affects women might be significant [36]. In both places, women reported engaging in more healthful practices to stave against cancer thandidmen. It is crucial to involve men in cancer prevention initiatives in order to increase awareness and encourage health-seeking habits [37].

Advantages of the research

The poll was crafted pursuant to a preceding investigation and was first tested in an analogous setting. After that, the survey materials were written in both Arabic and English to help research participants understand them better and to lessen any difficulties that could have arisenwhilecollectingdata.

Study limitations

Analogous to all other cross-sectional research designs, this one displays the result and the exposure simultaneously. Therefore, using this study design alone to prove a cause-and-effect link is not practical.

Conclusion

Cancer is a multifaceted illness that involves intricate changes to the body's physiological state. Looking for effective cancer treatment options is vital given the serious consequences of the disease.No Significant correlation exist between Gender and KAP factor. Knowledge Domain (Male: P= 0.138, x2

=1.888, Female: P= 0.534, x2 = 1.768). To gather broad information about public health awareness of preventative strategies and care, the KAP survey is helpful. In light of the study's findings, we draw the conclusion that training health and human services personnel to implement gender-based initiatives centered on cancer treatment methods is essential. It is not sufficient to just list the obstacles and difficulties in receiving cancer care; community-based participatory research, data gathering, and analysis are essential to the development of health programs that are successful.

Acknowledgments

We convey our gratitude to the Healthcare Professionals who agreed to participate in this study.

Funding

There is no financial support for the article

Data Availability

The research article and supplementary material contain the original contributions achieved during the study; for additional information, approach the corresponding author.

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