iJRASET
International Journal For Research in Applied Science and Engineering Technology



# INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

**Volume:** 6 **Issue:** V **Month of publication:** May 2018

**DOI:** http://doi.org/10.22214/ijraset.2018.5316

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
*ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 6.887*
*Volume 6 Issue V, May 2018- Available at www.ijraset.com*

# A Comparative Study on Breast Cancer and its Associated Risk Factors

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***Abstract:*** ***Breast Cancer is the second most common malignancy among Indian women accounting for 19-34%, next to cervical cancer. By early detection, understanding its pathogenesis and morphological features of the associated risk factors, one can prevent mortality against breast cancer. In India, high mortality is due to late diagnosis, poverty, fear and denial as majority of the patients present their condition in advanced or metastatic stage. The various risk factors associated with breast cancer include increasing age, geographical location, reproductive factors like early menarche or late menopause, family history, genetic mutations, nulliparity, avoiding breast-feeding, previous history of benign breast disease, exposure to radiations, use of exogenous hormones, obesity, dense breast tissue, sedentary lifestyle, smoking and. The aim of the present study was to assess the prevalence of associated risk factors of breast cancer in pre-menopausal and post-menopausal women of Hyderabad. A survey on 152 cancer women and 150 non-cancer women was done. A well structured questionnaire was employed to interview the subjects about their age, BMI, family history, reproductive health, diet and lifestyle. The data so collected was subjected to statistical analysis using chi square test. The results showed a positive correlation between breast cancer risk and age, increased BMI, family history, early marriage, late childbirth, consumption of exogenous hormones and breast-feeding (p<0.05). An awareness was also done through an illustrative brochure to educate the women about early detection of breast cancer, to implement healthy lifestyle interventions, importance of breast-feeding and poor impact of westernization of lifestyle. Thus, it was concluded from our study that there is a great impact of hormone-related factors and family history in the development of breast cancer.***

## I. INTRODUCTION

The mammary gland is a unique organ that undergoes extensive remodeling and differentiation even in adults. Hormonal changes in each menstrual cycle induce waves of proliferation in the mammary epithelium, whereas pregnancy leads to extensive ductal branching and alveogenesis [1]. Breast cancer starts when cells in the breast begin to grow out of control. These cells usually form a tumor that can often be seen on an x-ray or felt as a lump

[2]. Breast cancer is the most frequently diagnosed cancer and the leading cause of cancer death in females worldwide, accounting for 23% (1.38 million) of the total new cancer cases and 14% (458,400) of the total cancer deaths in 2008 [3]. Increasing trends in developing areas are often considered the result of the 'westernisation' of lifestyles, an ill-defined surrogate for changes in factors such as childbearing, dietary habits and exposure to exogenous oestrogen, towards a distribution closer in profile to that of women in industrialised countries. As a consequence of changing exposures to reproductive and nutrition-related determinants over time, women are at increasingly high risk of breast cancer, with incidence rates increasing in most countries and regions of the world in the past few decades [4]. In India, due to industrialization and urban development, delayed and reduced fertility, increasing longevity, and Westernization of lifestyle, the incidence of breast cancer is rising steadily, particularly in younger birth cohorts, and it is likely to soon overtake cervical cancer as the most common malignancy among Indian women [5]. Late diagnosis is a major factor for increased mortality as the majority of the patients present in advanced or metastatic stage. This is primarily attributed to lack of access to medical facilities, virtually non-existent breast cancer screening programs, lack of awareness and social-cultural attitudes [6]. Breast cancer can begin in different areas of the breast — the ducts, the lobules, or in some cases, the tissue in between. The different types include non-invasive, invasive, and metastatic breast cancers, as well as the intrinsic or molecular subtypes of breast cancer. Each of these subtypes has different risk factors for incidence, response to treatment, risk of disease progression, and preferential organ sites of metastases [1]. Screening of breast cancer at the earliest will help to treat the cancer in its early stages. The most common symptom of breast cancer is a new lump or m ass, which needs to undergo screening to determine if it i s benign or malignant [7]. Breast Cancer may be cause d by increasing age, geographical location, reproductive factors like early menarche or late menopause, family history, genetic mutations, nulliparity, avoiding breast-feeding, previous history of benign breast disease, exposure t o radiations, use of exogenous hormones, obesity, dense breast tissue, hormone replacement therapy, consumptio n of fatty food and sedentary lifestyle, smoking, alcohol and exposure to certain environmental pollutants [8, 9, 10, 11, 12, 13, 14]. Breast tumor stage can be determine d depending on tumor size, invasive nature, lymph node involvement and

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spreading places. Genetic testing of B RCA mutation is one of the powerful tools for predicting breast cancer using various technologic advancements like digital radiography, MRI, ultrasound and tomosynthesi and thereby reduce mortalities and increase life expectancies [15, 16]. The present study was aimed to assess the prevalence of all the risk factors associated with Breast Cancer, focusing more on reproductive factors which ha ve a direct impact on breast cancer development.

## II. MATERIALS AND METHOD

A cross-sectional, multi-centered, strat ified and correlational study was performed with a sam ple of 302 subjects, which included cancer women and no n-cancer women aged 20 years and above, belonging to pre-menopausal and post-menopausal stage. Data was collected from cancer women by visiting cancer hospitals in Hyderabad like, Yashoda Cancer Institute-Malakpet, Mehdi Nawaz Jung Cancer Hospital-Lakdikaphul, K IMS bibi hospital-Malakpet and KIMS Hospital-Secund erabad. Whereas, data from non-cancer women was c ollected by visiting random households, students from A nwarul-Uloom College-Mallepally and female family relatives of cancer women. The purpose of selecting non-cancer women in comparison to cancer women was to assess the prevalence and magnitude of risk factors in cancer afflicted women compared to protective factors among non-cancer women. An interview-cum-questionnaire meth od was used to collect the data from the respondents, w ho were questioned about their anthropometric information, family and reproductive history, diet and lifestyle. Stat istical analysis using chi square test was applied to show the significant association between breast cancer

## III. RESULTS AND DISCUSSION

Fig. 1 shows that out of 152 cancer women, 51% of them were obese and 25% were overweight. Statistical analysis of the data for cancer women was fou nd to be significant at p=≤0.05, which shows a positive correlation of breast cancer risk with increased BMI. The increase in BMI may be due to their sedentary lifestyle and lack of physical activity, family inheritance or consumption of fatty food. While in non-cancer women, normal BMI was found to give a protective effect.

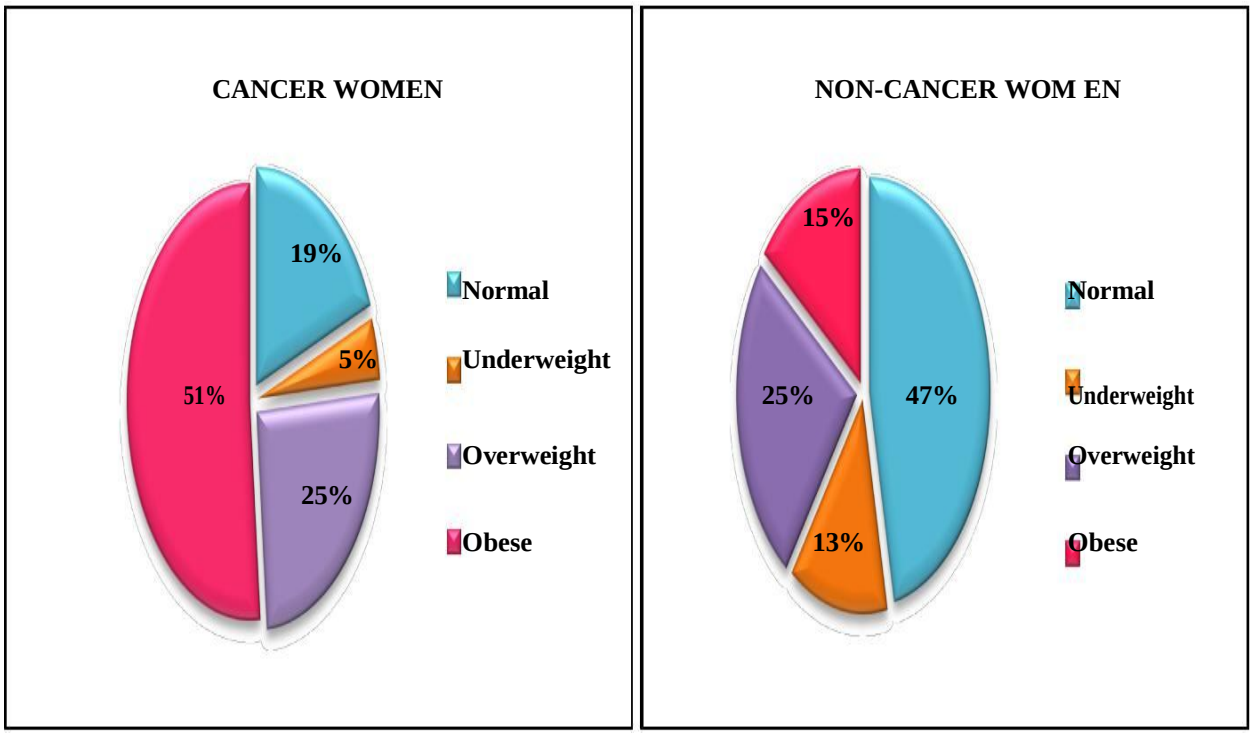



Fig. 1 shows the BMI of 152 cancer women and 150 non-cancer women.

Fig. 2 shows the family history of 152 cancer women and 150 non-cancer women. The data belo w depicts that out of 152 cancer women, 64% of them inherited genes which led them to develop breast cancer. W hereas in non-cancer women, there was a protective effect i n 60% of women who had no family history of breast cancer. The chi square value for family history in cancer wo men was found to be p-value <0.001 significant at p=≤0.05. This draws to a conclusion that a women's risk in deve loping breast cancer is two or more times greater if she h ad a family history.

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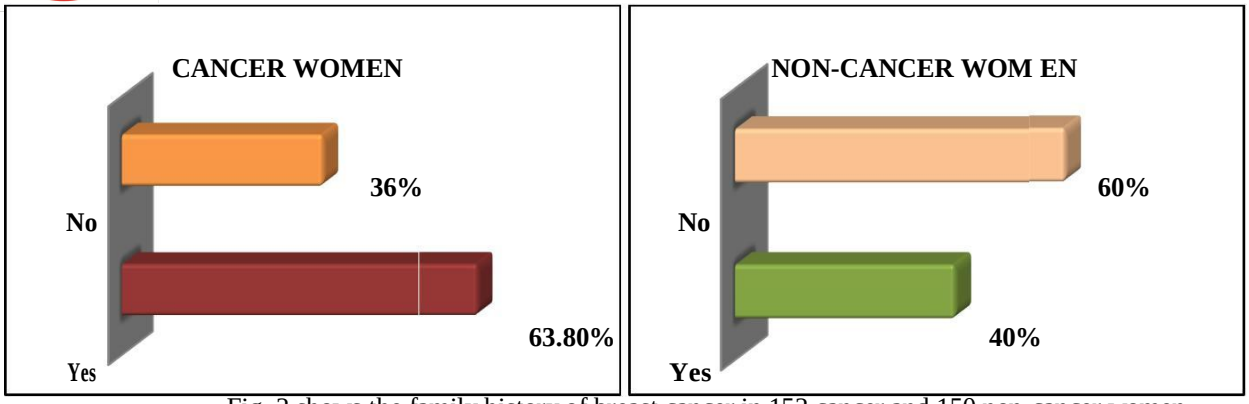



Fig. 2 shows the family history of breast cancer in 152 cancer and 150 non-cancer women.

Fig. 3 shows that in India, early marriage is still being practiced which is clearly evident from the data below. Most breast cancer women had married under 20 years of age which implies early sexual relationship which resulted in discrepancy or elevation in the secretion of the female sex hormones (mostly estrogen horm one) among female teenage years. Therefore, early marriag e may be considered to be inaudible risk factor of getting breast cancer in the future.

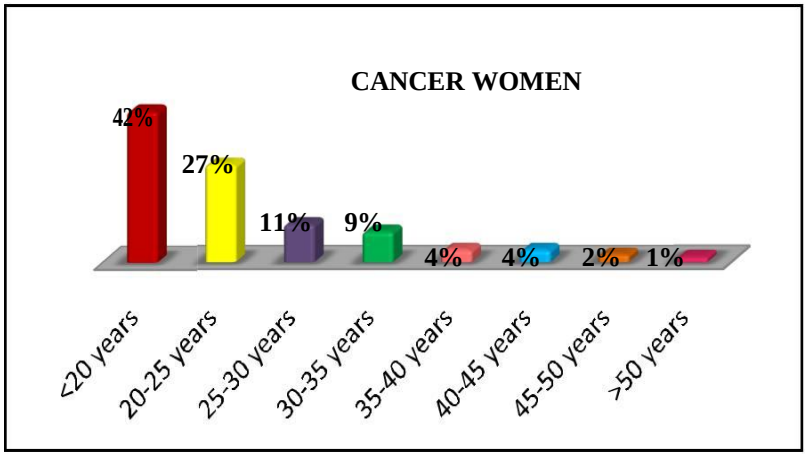



Fig. 3 shows the ag e of 152 cancer respondents at the time of their marriage .

Fig. 4 shows that 22% of cancer femal es had their first pregnancy after 30 years of age. Pregna ncy causes extensive changes to the breasts, making breast cells less likely to multiply and less likely to develop tumours. But it is not so after the age of 35, when the breast tissue is more likely to have accumulated cells carrying cancer-causing mutations, or clusters of abnormal cel ls with the potential to become cancerous. Therefore, there is a significant association of late child birth (>30 years of age) with breast cancer development.

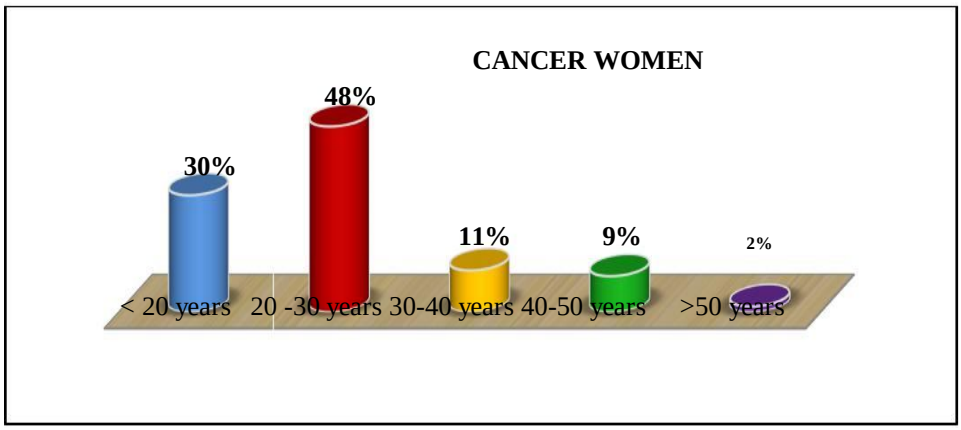



Fig. 4 shows the age at the time of first child birth for 152 cancer women.

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The data in Fig. 5 indicates that 81% of cancer females claimed to have breast-fed their children . Breast-feeding has a protective role in the prevention of br east cancer as there is excretion of carcinogenic agents fr om the breast ductal tissue through breast-feeding. But the duration of breast-feeding is important for its protective role (fig.6). The rest 19% of cancer females completely avoided breast-feeding due to several reasons like abortions, insufficient milk supple, nipple pain, cracked nipples, bloody discharge while also believing in myths like breast-feeding causes weight gain and poor body posture.

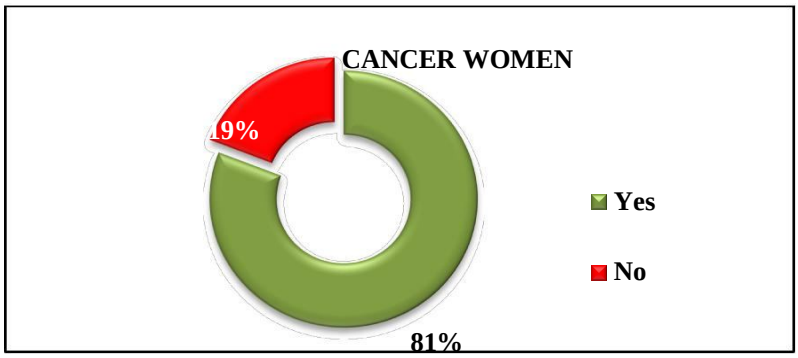



Fig. 5 shows the perceentages of 152 cancer women who have done breast-feeding.

Fig. 6 shows that 81% of cancer wome n who revealed that they had done breast-feeding, the d uration was found to be less than 3 months in the majority for 33% of them and 30% of them had done breast-fee ding for 3-6 months. While in non-cancer women, a majorit y of 21% women had done breast-feeding for 1-2 years w hich seem to have a protective effect on them against breas t cancer. With chi square value which was found to be si gnificant at p=≤0.05, breast-feeding for an extended period o f time is associated with a decreased risk of breast cance r and this protection may be greatest among women under 50 years of age.

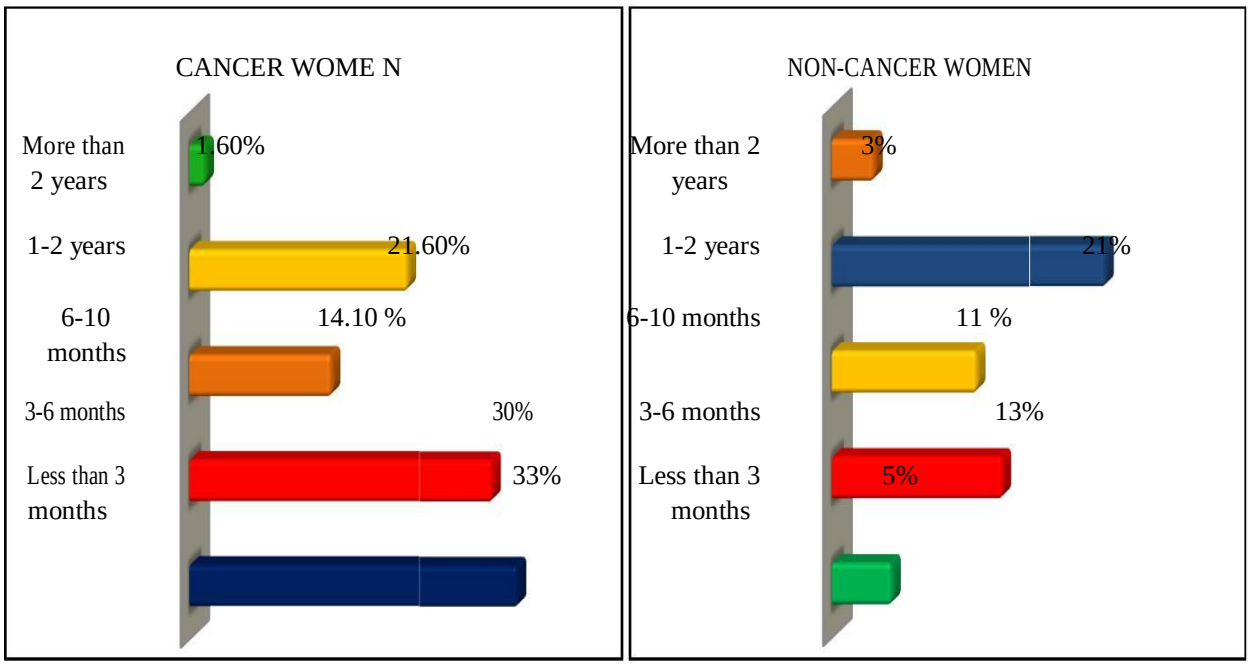



Fig. 6 shows the percentage duratio n of the breast-feeding in 152 cancer women and 150 no n-cancer women.

Fig. 7 shows that in cancer females, 40% had taken oral contraceptive pills and some of them ha ve claimed that they used such pills for an extended period of time. The risk of breast cancer increases by 24% among the women who have oral contraceptives, compared to those who have never used the pill [17]. With significant chi square value tabulated at p=≤0.05, consumption of OC pills shows a positive correlation with the increase in the risk of breast cancer amongst cancer afflicted women .

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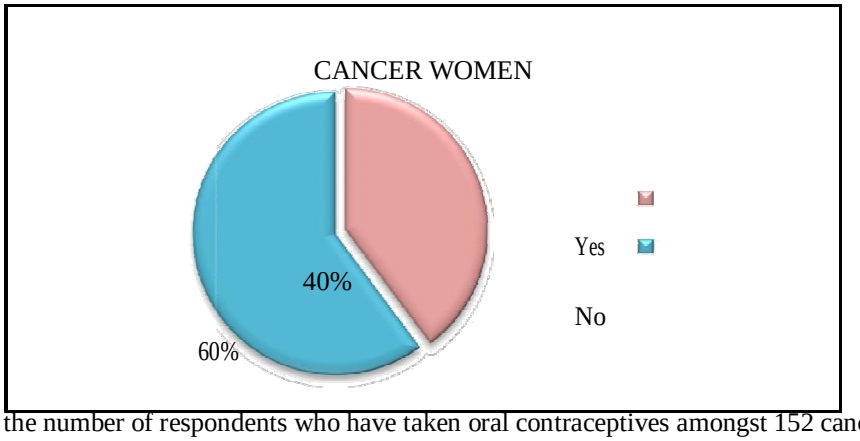



Fig. 7 shows the number of respondents who have taken oral contraceptives amongst 152 cancer women.

## IV. CONCLUSION

From the above graphical and statistic al analysis, our study concluded that breast cancer risk i s strongly associated with BMI, family history, early marria ge, late childbirth and consumption of exogenous horm ones. Our study also assessed the correlation of breast canc er with other factors like age, exposure to radiations, parity, diet, physical activity, smoking and alcohol but thes e factors were found to have a slight effect than the previously mentioned ones.

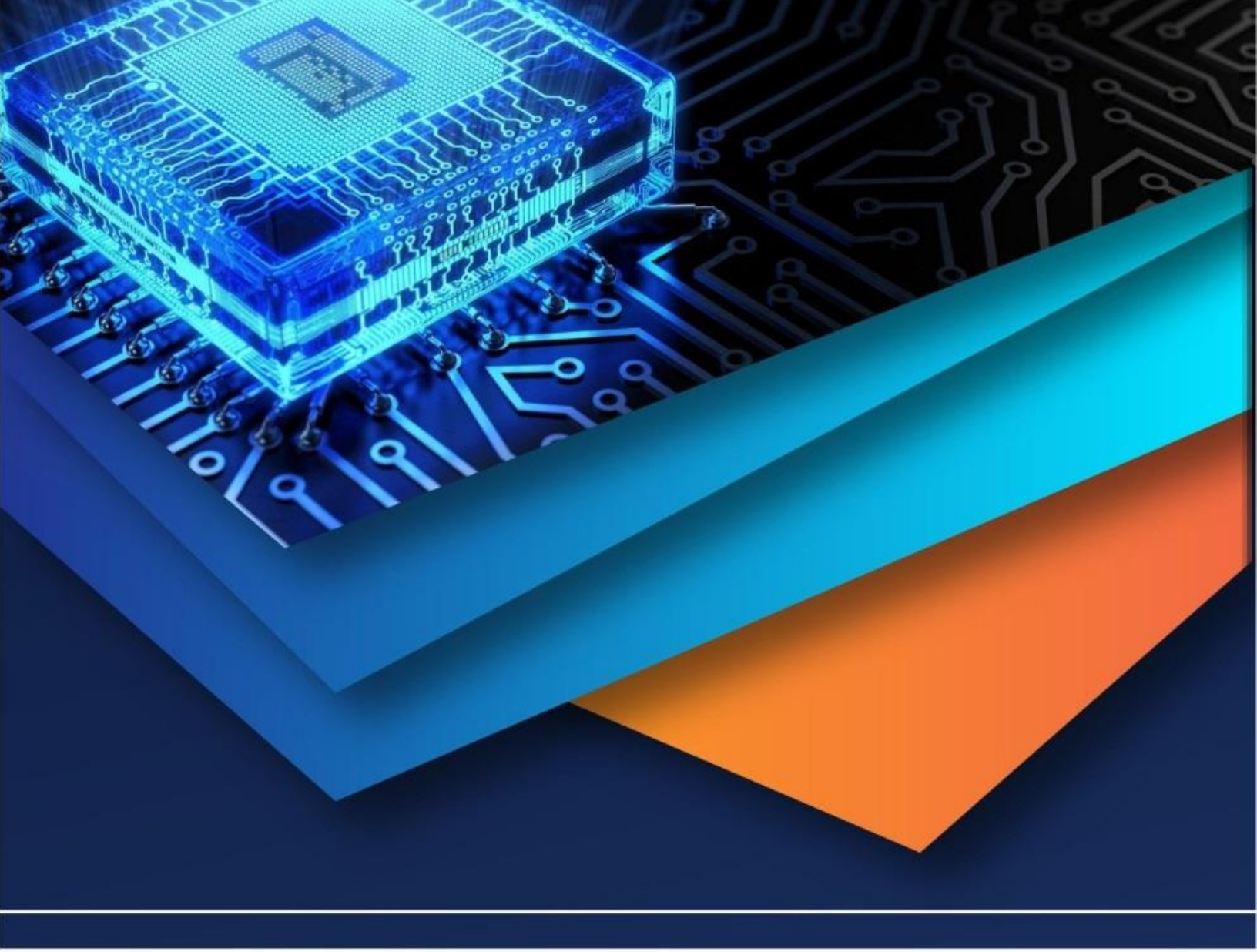
## V. ACKNOWLEDGMENT

The authors would like to thank the H OD of Anwarul Uloom College for moral support and the HR team, chief dieticians and nurses of the cancer hosp itals for data collection.

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