Biological Factors Affecting the Breast Cancers among Sri Lankan Women: A Case Study of Wathupitiwala Base Hospital

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Degree of Master of Science in Business Statistics

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Dissertation submitted in partial fulfilment of the requirements of the Degree of Master of Science in Business Statistics

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DECLARTAION OF THE CANDIDATE

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The above candidate has carried out research for the Master's Dissertation under my supervision.

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Abstract

Breast cancer remains a significant public health concern worldwide, with varying risk factors across diverse populations. The incidence of breast cancer in Sri Lanka is also observed to be on the rise, with nearly 3000 women being diagnosed each year. Therefore, the objective of this research is to identify the underlying relationships between significant biological factors affecting the breast cancers among Sri Lankan female population and to uplift the awareness of risk factors among total population.

This study case study was carried out at one of the Base Hospitals in Sri Lanka. The data set was acquired from the patients admitted to the medicine ward of Base Hospital, Wathupitiwala, Sri Lanka. Data collection was carried out by a team of trained medical graduates and nurses between January 2018 and August 2018 period. In this study, data from a total of 144 participants were collected, and it is important to note that all individuals included in this research cohort had tested positive for breast cancer. Data were gathered across 17 distinct variables, encompassing both continuous and categorical variables. Specifically, these variables include Age, Incidental lump, Breast pain, Nipple discharge, Nipple retraction, Breast asymmetry, Age at menarche, Age at first childbirth, Number of pregnancies, Number of children, Breast feeding history, Age at menopause, Usage of Oral Contraceptives, Usage of depot Provera, Family history, Skin Nodule, and Skin ulceration. Principal Component Analysis (PCA) based on Factor Analysis was employed for the analysis of the dataset. The initial dataset underwent a rigorous cleaning process utilizing diverse methods within SPSS, followed by a comprehensive data validation step involving Normality testing. Subsequently, factors were derived, and the correlations between these factors and the initial variables, denoted as factor loadings, were established. Through this analysis, variables exhibiting factor loading values surpassing 0.5 were identified as highly correlated with their respective principal components.

Notably, the study pinpointed the relationship among most significant risk factors associated with breast cancer incidence among Sri Lankan women. These prominent relationships include Number of Children and Number of Pregnancies, Skin Ulceration, Skin Nodule, Breast Asymmetry and Nipple Retraction, Age, Age at menopause and Use of Depot Provera, Nipple Discharge and Breast Pain. While the risk factors of Breast Feeding and Age at Menarche are incorporated into distinct components, there is no discernible significant relationship between these two factors and any other risk factors.

Keywords: (Breast Cancer, PCA, Tumors, Biological factor)

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