

Predictive Analytics of Emotional Intelligence in Women Suffering with Breast Cancer

V Kakulapati, B.S.S. Deepthi, S. Mahender Reddy

Abstract: Now a day's women suffer with Breast cancer due to depression and anxiety result in life threat which is second place in various types of cancers. The goal of this study is to investigate the association between resilience and cognitive sentiment analysis and mental health of the woman who suffered by breast cancer. Develop a statistical model by utilizing the multiple regressions for predicting breast cancer patients, which involves the least square's inference problem to approximation the parameters. The implementation results exhibit significant association between refusal resilience and cognitive sentiment analysis and mental health of breast cancer patients. Also, predicting obsessive rumination of breast cancer patients and their sentiment analysis is the preeminent refusal for the healthiness of the model.

Index Terms: statistical model; Negation resilience; cognitive emotion; obsessive rumination; cancer.

I. INTRODUCTION

Conferring to the survey's women is prone to cancer, which is the second popular among different cancer types of cancer. According to the recent survey most of the women are suffering by the breast cancer, which is the most recurrent and dangerous threat to a woman's life [1]. Primarily, Breast cancer patients experience depression and anxiety [2], which are an implication resulting sickness, physiological aspects or medicinal healings. Among cancers, it is the most prevalent cancer in women and the widespread origin of death for women lying in the range of 40 to 44 years. Psychological disorders observed in breast cancer patients with psychological, physical, social-emotional, cognitive problems and their respective assortment will continue when coping strategies such as safeguarding the causes of conflict that these disorders affect the patient's self-esteem and increase negative information about themselves and encounter patients with several disparate problems [3].

In general, chronic pain in patients comes with depression, interpersonal distress, sleep disturbance, fatigue, emotional problems, cognitive, and physical and reduced psychological functions. The depression is the common most traits in Women suffering from Breast Cancer, the incompatibility of functional flexibility (resiliency), social stress and family environment. Emotional intelligence (EI) packs the most important aspects being perception, processing, regulation and management of emotions [4, 5]. One such personal

characteristic stands out to be EI and is referred to a greater extent in medicine, nursing and other healthcare professions [6]. EI is a more crucial component to cure and the effective observing of breast cancer patient with respect to health care providers.

Sentiment plays a major role mainly in women patients who suffered with breast cancer which has more attention with respect to personal behaviour. Feeling is gaining more attention in physiological and behavioral the hypothesis [7]. Emotional attachment towards any personal behavior is not at all possible to separate from task activities [8].

A number of statistical techniques are enclosed in Predictive

analytics, such as machine learning, predictive modeling and data mining that help one to analyse historical and current facts to give predictions regarding the future or events whose outcome are unknown. The intention of our study is to analyse the association between cognitive sentiment analysis and their ability to cope with obsessive rumination of women suffering from breast cancer.

Possible recommendations can be given for women suffering from breast cancer so that they can manipulate their psychological behavior in a positive manner which will be helpful in overcoming the disease effects. Not only can the severity of the disease be framed for the increased mortality rate in patients but also because of their negative emotions and obsessive rumination that comes as a side effect. Along with the medical treatment they should also be given the psychological treatment to overcome the disease.

II. RELATED WORKS

Regression analysis predicts the quality of life [9] which reveals that self-regulation 0.18 of the inconsistency in functional, symptoms 0.26, and variance in the general health 0.37. A massive collection of thoughts that has repetitive aspect and focuses on the origins and significance and prevents signs and depression thoughts and increases the adaptive solution [10] can be termed as Obsessive rumination. Obsessive rumination can be the foundation of the patient and includes ideas that are reviewed endlessly and despair about the future and the negative assessment of oneself affect the people and the patient's motivation [11].

Patients diagnosed with breast cancer due to deaths have obsessive rumination disease and often lack the resiliency and

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flexibility, and control of disease problems that are usually less severe and they do not have control over their lives or their fate is out of control [12].

The biggest turmoil in one's life is a woman acquires diagnosis with breast cancer, which is the primary reason induction with psychological distress observed in the patient. Extensive studies have shown that varying levels of depressive symptoms [13] are depicted by the body language of patients diagnosed with breast cancer. Observing patients with this kind of cancer report depressive symptoms after post-surgery with the percentage of 5 to 15, which can increase when screening the more patients [14]. After analysis and conduct healing breast cancer patients continuously, significant clinical depression [15] is still observed among patients. Other serious consequences can be observed other than physiological disorders [16], cognitive emotions lead to such a drastic increase in mortality in patients with breast cancer [17]. Many researchers described that the breast cancer patient's individual control is related inferior distress [18], with this inner control can predict the inferior intensity of distress more effective coping.

The analysis of breast cancer in women varies according to the race. The aim of this study is to create awareness regarding breast cancer which women were and are suffering all over the world and also this present study focuses on the women who were considered as a victim through diagnosis and help them follow the particular measures based on their symptoms. The emphasis for make the women strong to overcome the disease.

III. METHODOLOGY

Predictions are executing by consider emotions and sentiments of women suffering by breast cancer. The research plan is co-relational. In this work utilized multiple regressions to analyze these results which show the relationship between the negation resilience, cognitive emotion and the obsessive rumination of women with breast cancer. The data is classified by applying multiple regression technique and suitable recommendations are given to the women who are suffering from breast cancer so that we can reduce the mortality rate.

Patient's experiences emotions such as "happiness" and "sadness" seem to be simple, there is significant mental health gives a more understandable concept of emotions. It can be occurring in two phases, an event is practice by human either positive or negative, and sentiments are elicit rapidly. Then an expressive stimulus activates attitude, physiological, and attention responses [19].

Patient's data collected from a heterogeneous data [20] originate that the occurrence of anxiety 22%, depression 13% and 9% combining by both after diagnosis. These observations were made by Linden et al., who observed percentages of anxiety and depression over 10,000 heterogeneous samples [21]. Among these cancer patients, 19.0% patients suffered with anxiety and 12.9% of patients suffered with depressive symptoms. Another 22.6% and 16.5% had both anxiety and depression, respectively. Many researchers found that breast cancer patients had considerable

anxiety and depressive symptoms than other type of cancer patients.

A. Regression Analysis

One among many statistical processes for finding out and estimating relationships between the variables is termed as "Regression Analysis". It is a binding of many techniques to model and analyses the different variables. These are different types of regression techniques used to analyse and process the data to predict the relationship between the variables. These predictions are used in many fields like business and hospitals.

B. Multiple Regressions

To predict the dependent variable based on one or more independent variables, we use multiple regressions. Multiple regression consists of one dependent variable and two or more independent variables.

This technique is widely utilized in social and natural sciences research. The general question in multiple regression is "what is the best predictor of ...". For instance, Psychologists may desire to resolve which behavior variable best predicts collective regulation. And also allows determining the overall fit (variance explained) of the model and the comparatively involvement of each of the forecasters to explain the total variance.

IV. IMPLEMENTATION

A. Input data

In this work, dataset collected about the people who are suffering from breast cancer from dataworld which is publically available. And after collecting the data set pre-processed the data by removing all the null and empty values to make the data cleaned. By processing the data we reduce redundant values and make the data set available for further implementation.

B. Multiple Regression techniques

After preprocessing the data we apply multiple regression technique to find out the stages of the patients who are suffering from breast cancer. After pre-processing we predict the stage of their disease and based on their stage, we provide recommendations to the women in order to cope up with their disease. In this method, we consider survival as the predicted variable and the dependent variables are age and chemo.

C. Result

After performing both the sentiment and regression techniques we manually combine the data from the predicted values from multiple regression and the outcomes from sentimental analysis and find the outcomes and provide the recommendations to make women overcome with the disease.

D. Recommendation system

As 10 percent of women all over in India is suffering by Breast cancer. Among this 10 percent eighty percent of women are caused to death.



The cause of death is not only due to severity but also due to their negative resilience (means not having ability to cope up) the disease. So we are trying to recommend these people so that they can come out of their situations and to overcome their emotions and mental ability so that we can reduce the mortality rate of women by making them brave and express the feelings.

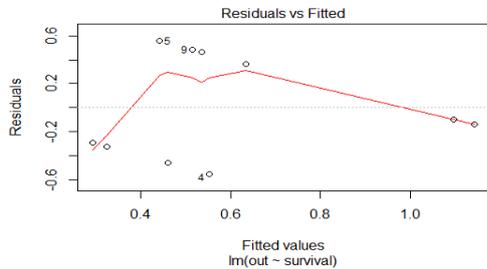


Fig 1. Residuals Vs Fitted variables.

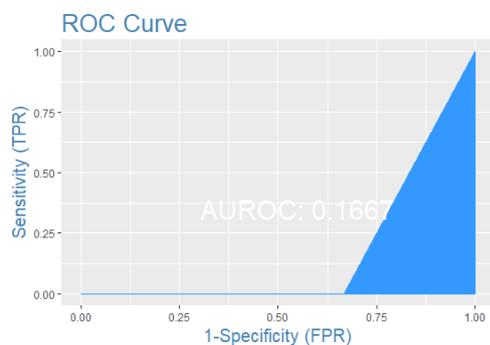


Fig 2: Sensitivity vs specificity

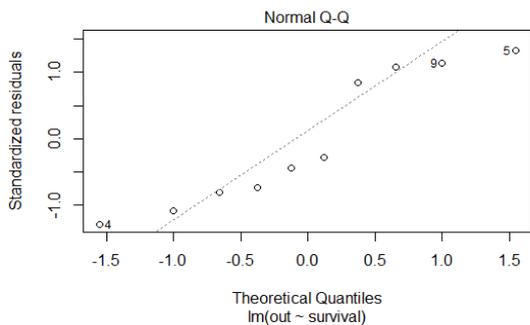


Fig 3: survival standardized residuals

Residuals:

Min	1Q	Median	3Q	Max
-3.416	-2.054	-1.050	1.449	4.964

Coefficients:

	Est.	Std. Error	t value	Pr(> t)
(Intercept)	6.023	1.530	3.936	0.00432 **
out	3.830	1.976	1.939	0.08854 .

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 3.061 on 8 degrees of freedom
Multiple R-squared: 0.3196, Adjusted R-squared: 0.2346
F-statistic: 3.758 on 1 and 8 DF, p-value: 0.08854

negative	positive	sentiment	file
1	10.	6.	-4. s133.txt

FileText

After noticing a lump during a breast self-exam in 2010 I had a biopsy. I received a dreaded result? it was cancer. A lumpectomy and sentinel node biopsy revealed tumors in three lymph nodes that were larger than the one in my breast. I was diagnosed with stage II breast cancer, and I would require another surgery to get a clean margin, as well as chemotherapy and radiation therapy.

I was devastated. I was still grieving the loss of my husband, Gary, from a heart attack. I felt overwhelmed by fear. I thought cancer would change my life forever, and I was discouraged. I felt my body had somehow betrayed me.

Fig 4. Example of dataset emotional text

Deviance Residuals:

1	2	3	4	5	6	7	8	9	10
-0.14728	0.00073	-0.38030	-0.17483	0.70167	-0.55440	0.17521	0.11766	0.26153	0.00000

Coefficients:

Estimate	Std. Error	t value	Pr(> t)
(Intercept)	0.65923	2.28110	0.289 0.787
Age	-0.02797	0.05628	-0.497 0.645
Survival	0.11799	0.07012	1.683 0.168
Event death	-0.11846	0.69855	-0.170 0.874
Amputation	-0.05743	0.45482	-0.126 0.906
Chemo	0.53303	0.43749	1.218 0.290

(Parameter of dispersion for family of Gaussian obtain to be 0.2773822)
Null deviance: 2.4000 on 9 degrees of freedom
Residual deviance: 1.1095 on 4 degrees of freedom
AIC: 20.392
Number of Fisher Scoring iterations: 2
Predict (model, new data=data.frame (age=34, survival=10.4)) = 0.7734922

V. CONCLUSION

The goal of this study is to investigate the association between resilience and cognitive sentiment analysis and mental health breast cancer patients. Research plan is co-relational. We are utilizing the learning statistical model with multiple regression analysis technique are used for analyzing the results. In this work, provide positive recommendations to the breast cancer patients to overcome the physiological distress.

VI. FUTURE ENHANCEMENT

There is a lot of scope to topic modeling which led to new research in this field as it is machine learning related topic, it forms the base for Deep learning concepts which works on the principle based on the neural networks of the brain. In this work observed patient's sentiment analysis to examine cancer stage in patients. In future, we further analyzed the psychological development occupied in the emotional alteration to persistent cancer, mainly emotion-extraction. In the future work, also implement similarities between breast cancer patient depression levels and improved association between refusal resilience and cognitive attitude.

REFERENCES

1. Smith RA et al., Cancer screening in the United States, 2013: a review of current American Cancer Society guidelines, current issues in cancer screening, and new guidance on cervical cancer screening and lung cancer screening. CA Cancer J Clin. 2013;63(2):88- 105.



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2. Kashani F et al. The effects of relaxation on reducing depression, anxiety and stress in women who underwent mastectomy for breast cancer. *Iran J Nurs Midwifery Res.* 2012; 17(1):30-3.
3. Wells, H.B. *Depressive rumination: Nature, theory, and treatment* (107-124). New York: Wiley 2009.
4. Fariba et al., "The Relationship between Resilience and Cognitive Emotion Regulation and Obsessive Rumination of Woman with Breast Cancer" *European Online Journal of Natural and Social Sciences* 2015, Vol.4, No.1 Special Issue on New Dimensions in Economics, Accounting and Management ISSN 1805-3602.
5. Arora S, Ashrafian H, Davis R, et al. Emotional intelligence in medicine: a systematic review through the context of the ACGME competencies. *Med Educ.* 2010; 44(8):749-64.
6. Birks YF, Watt IS. Emotional intelligence and patient-centred care. *J R Soc Med.* 2007; 100(8):368-74.
7. Fineman, S et al., *Emotion and Organizing. Handbook of organization studies.* London: Sage, 1996
8. Sandelands, L. E. The concept of work feeling. *Journal for the theory of social behaviour*, 18, 437-457, 1988.
9. Zahra Nikmanesh et al., "Examining the Predictive Role of Emotional Self-Regulation in Quality of Life and Perception of Suffering among Patients with Breast Cancer", *Middle East Journal of Cancer*; April 2017; 8(2): 93-101.
10. Khosravi, M., Mehrabi, H.A., & Azizi Moghaddam, M. (2008). A comparative study in patients with depression and obsessive-compulsive rumination component with ordinary people, *Journal of Medical Sciences*, 1 (1), 43-56.
11. Lo, C.S.L., Ho, S.M.Y., & Hollon, S.D. (2014). The effects of rumination and negative cognitive styles on depression: A mediation analysis, *Behavior Research Therapy*; 46, 487-495.
12. Mirzamani, M et al., Validation of Haven and Yale Multidimensional Pain Inventory in patients with chronic pain, *Qom University School of Medicine*, 1 (3), 22-34, 2007.
13. Chochinov HM. Depression in cancer patients. *Lancet Oncol.* 2001;2(8):499-505.
14. Fann JR, Thomas-Rich AM, Katon WJ, Cowley D, Pepping M, McGregor BA, et al. Major depression after breast cancer: a review of epidemiology and treatment. *Gen Hosp Psychiatry.* 2008;30(2):112-26.
15. Hopwood P, Sumo G, Mills J, Haviland J, Bliss JM. The course of anxiety and depression over 5 years of follow-up and risk factors in women with early breast cancer: results from the UK Standardisation of Radiotherapy Trials (START). *Breast.* 2010;19(2):84-91.
16. Badr H, Milbury K. Associations between depression, pain behaviours, and partner responses to pain in metastatic breast cancer. *Pain.* 2011;152(11):2596-604.
17. Satin JR, Linden W, Phillips MJ. Depression as a predictor of disease progression and mortality in cancer patients. *Cancer.* 2009;115(22):5349-61.
18. Henselmans I. Psychological well-being and perceived control after a breast cancer diagnosis [unpublished doctoral dissertation]. Groningen, The Netherlands: University of Groningen; 2009.
19. Gross, J.J. The emerging field of emotion regulation: An integrative review. *Rev. General Psychol.* 1998, 2, 271-299. [CrossRef].
20. Boyes, A.W.; Girgis, A.; D'Este, C.A.; Zucca, A.C.; Lecathelinais, C.; Carey, M.L. Prevalence and predictors of the short-term trajectory of anxiety and depression in the first year after a cancer diagnosis: A population-based longitudinal study. *J. Clin. Oncol.* 2013, 31, 2724-2729. [CrossRef] [PubMed]
21. Linden, W.; Vodermaier, A.; MacKenzie, R.; Greig, D. Anxiety and depression after cancer diagnosis: Prevalence rates by cancer type, gender, and age. *J. Affect. Disord.* 2012, 141, 343-351. [CrossRef] [PubMed].