

Full Length Research Paper

Perception of medical awareness of media analyzed by multilayer perceptron

K. Ravichandran*, S. Arulchelvan and K. Periyakannan

Department of Media Science, Faculty of Media Sciences, Anna University, Chennai-25, India.

Received 24 July, 2018; Accepted 25 September, 2018

The study considers the perception of medical errors and media awareness. This study identifies the effectiveness of the television media intervention in creating awareness on medical malpractices and it has find out the impact of maintaining medical records of a family online by the family doctor in reducing medical malpractices. This creates the importance of service quality in medical industry through the multilayer perceptron. At first, a substantial arrangement of components is figured out on each of the therapeutic mistake perceptions and media awareness. One inquiry of interest is how a multilayer perceptron (MLP) does handle such pointless inputs? The leftmost box plot shows, for cases that have observed awareness strongly disagree, the predicted pseudo-probability of category strongly disagree. The media awareness has been demonstrated observationally to be both predictable and valuable. MLP was used for data analysis.

Key words: Multilayer perceptron (MLP), classification, medical awareness, probability, cumulative gains and television.

INTRODUCTION

This study identifies the effectiveness of the television media intervention in creating awareness on medical malpractices. At first, a substantial arrangement of components is figured on each of the therapeutic mistake perceptions and media awareness. The news of the medical malpractices has started hitting the headlines in the daily news bulletins of the television media (Ravichandran and Arulchelvan, 2016; Ferreira, et al., 2013). Collected data were analyzed with the help of software package SPSS. The x-axis corresponds to the observed response categories, and the legend corresponds to predicted categories. Following a short description of the multilayer, the perception was analyzed for comparison of medical errors and media awareness (Deveugele et al., 2002). One expansion of the saliency

measure is its application of the shrouded hubs of a multilayer discernment. Opinion about medical service quality was elicited from the perspective of television media towards medical malpractices on features like reliability, reasons, conception, consumption and awareness. Results obtained using the MLP are at least as good as those obtained using this discriminated analysis (Ushie et al., 2013). Unexpectedly, little work has been refined to legitimately illustrate their presentation in such an application. The utilization of multilayer perceptions has been a lot of eagerness as classifiers in example of acknowledgment issues. The components may incorporate length-to-width proportion, normal restorative blunders, the complexity proportion of awareness, and so on. This study is to evaluate whether

*Corresponding author. E-mail: ravi.news10@yahoo.com.

the data collected on all the measures fit the recommended value by the MLP model.

Significance of the study

The aim of this study was to assess the use of the MLP, for discriminated analysis tasks. Following a short description of the multilayer perceptron has analyzed for comparison of medical errors and media awareness. Results obtained using the MLP, are at least as good as those obtained using this discriminated analysis. We conclude with some comments on how the MLP differs from more widely used discriminate analysis methods.

Objectives of this study

This study identifies the effectiveness of the television media intervention in creating awareness on medical malpractices. It aims to find out the impact of maintaining medical records of a family online by the family doctor in reducing medical malpractices that create the importance of service quality in medical industry through the multilayer perceptron. This study aims to evaluate if the data collected on all the measures fit the recommended value by the MLP model.

REVIEW OF LITERATURE

In the ancient Indian culture, the Vaidyar (doctor) was considered as a demy god. Merely by their art and knowledge, the physicians gained high social status regardless of their caste of birth. The court physician was of political importance and sat on the right side of the throne of a king, an important symbolic place. In those days the Vaidyar treated patients equally irrespective of their social status and focused only on curing their diseases.

In the middle of the 20th century, the advent of modern medicine brought out a new set of doctors with allopathic medicinal backgrounds, who treated patients in their houses (Gupta, 1976). The academic study of medicine is driven by a need to serve society. During the late 1950s, the government was running the medical colleges from where the doctors came out. The government (Berg and Ryymin, 2018) met 80% of the cost of running the medical educational institutions. At the end of the 20th century, to meet the needs of a growing population and to increase the doctor-patient ratio, the government gave permission to run private medical academic institutions in the country.

Private medical colleges began to collect huge capitation and tuition fees and doctors who pass out of these institutions began to focus only on ways to spin more money in order to meet the expenses incurred in

getting medical knowledge (Lindsay, 2018). These doctors started treating patients in haste in order to treat more and more patients within a short period leading to many mistakes during treatment. According to the World Health Organization (WHO) reports, India is 67th in the list of 133 developing countries with a doctor-population ratio of 1:1700, compared to a world average of 1.5,1000 (Economic Times, 2017). That means, not even one doctor is available for a population of 1000; even after more than half century of independence; the goal is still far behind as per the recommendation given by Bhore Committee in 1946, subsequently modified by Mudaliar Committee in 1961 (Narlawar et al., 2018) and Bajaj Committee in 1987. India can achieve this in 2031 within the framework of existing colleges and state of affairs. Meanwhile, during the late 20th century, more medical hospitals came under big banners, started as public limited companies. They floated public shares and employed doctors with big pay packages. These medical hospitals instead of providing service to the society have become money spinning factories answerable to their shareholders. Instead of being service oriented institutions, they have become profit oriented companies that do not show any empathy for the patients (Kirby et al., 2018).

Post globalization many global companies began to set up their shop in India leading to the increase in the per capita income. This has led to a modern life style which has resulted in the incidence of non-communicable diseases (Popkin et al., 2012). This has led to the introduction of costly modern medical gadgets and has resulted in tremendous growth in private sector hospitals in India. The total number of beds in private sector medical hospitals has crossed more than 50 percent compared to that of the government hospitals in 2012. The hospital industry turnover is \$25 billion (Rs.1500 Cores). The key players of the Indian hospital sector analyzed in this article are Apollo Hospitals Enterprise, Fortis Healthcare and Kovai Medical Center and Hospital. The revenue of the three key players of the Indian private sector hospitals has seen a fivefold increase between 2009 and 2014. Revenue as at 2009 was 390 million dollars and was 1983 million dollars in 2014.

The patient who has been treated by the big private medical hospitals and who has become a victim of medical malpractices has to fall back on the guardians of law for their support to file cases to get compensation. But the guardians of law, instead of helping the victims to file their petitions succumb to the pressure of the big medical hospitals and refuse to accept the complaints (Ravichandran and Arulchelvan, 2016). Before the advent of television media in the Indian continent, the print media was ruling the Indian media environment. The public or patients grieved by the medical malpractice had to approach the print media alone for publishing their grievances, but the print media reach had a limited scope of reaching the public due to various environmental

factors (Linehan, 2018). After the advent of the television in India the private television channels telecasted many medical news and programmes and the public awareness of the medical malpractices have grown up. The public who grieved over the medical malpractices have started approaching the television channels to let out their grievances and the guardians of law have been compelled to support the patient's grievances in filing the cases due to media exposure (Radsky, 2013).

Gerbner, (1967) have been analyzing sample weeks of prime time and daytime television programming (Gerbner, 1967). Cultivation analysis usually involves the correlation of data from content analysis (identifying prevailing images on television) with survey data from audience research (to assess any influence of such images on the attitudes of viewers). Content analysis by cultivation theorists seeks to characterize 'the TV world'. Such analysis shows not only that the TV world is far more violent than the everyday world, but also, for instance, that television is dominated by males and over-represents the professions and those involved in law enforcement.

Cultivation theorists are best known for their study of television and viewers, and in particular for a focus on the topic of violence. However, some studies have also considered other mass media from this perspective, and have dealt with topics such as gender roles, age groups, ethnic groups and political attitudes. A study of American college students found that heavy soap opera viewers were more likely than light viewers to over-estimate the number of real-life married people who had affairs or who had been divorced and the number of women who had abortions (Nabi and Sullivan, 2001).

In our country events that gain wide coverage by media only attract the public's attention and there are no proper criteria to identify or investigate errors in health care either in the public or private sector (Graber and Dunaway, 2017). A physician can be charged with criminal negligence when a patient dies from the effects of anaesthesia during an operation or during any other kind of treatment, if it can be proved that the death was the result of malicious intention, or gross negligence. Before the administration of anesthesia or performance of an operation, a doctor is expected to follow the accepted precautions.

The main drawback is that the onus of proving medical malpractice falls mainly on the persons who have filled the case. To prove and to back up the case they have to find out a medical practitioner to come and testify before the court of law, which has become very rare (Danzon, 1985). The television media which started exclusive medical malpractice shows have to do extensive research using the web and feature other eminent doctors to analyze the evidence for medical malpractices. This has led to grieved patients quoting and bringing eminent doctors as a backup for their cases filled in the court of law (Angell, 1997).

METHODOLOGY

This study data were collected from 1000 patients from various hospitals in India in places like Chennai, Delhi, Mumbai, Hyderabad and Bangalore from November 2016 to February 2017. Opinion about medical service quality was elicited from the perspective of television media towards medical malpractices on features like reliability, reasons, conception, consumption and awareness. In this research study, the patients' perceptions were measured with self-administered questionnaires with MLP (Mannucci et al., 2010). The primary contributions of the present work are to address the computational challenge of analysis and visualization of multilayer information by providing a practical methodology, and accompanying software for the analysis and visualization of multilayer networks (Domenico et al., 2015). Collected data were analyzed with the help of software package SPSS. MLP was used for data analysis.

RESULTS AND ANALYSIS

The demographic profile of the crime news of public having involved in this study is 1000 samples, out of which, 54.9% were males and 46.1% were females. With regard to the level of education, 22.9% of the public had school education; 26.0% of them were undergraduates, 34.3% of the public were postgraduates and the rest 16.9% were professionals. Concerning the marital status of the respondents, the majority of them that is 60.9% were married and the remaining 39.1% were unmarried. With regard to the type of families, 52.9% of the samples were in nuclear families and the rest 47.1% are from joint families. When questioned about the number of families in the household, 20.3% of replied three members in the family; 36.3% of the sample had four members in the family; 26.0% of the people surveyed had five members of the family and 17.4% had more than six members in their families. The collected data reveal that, in terms of occupation, 16.0% of the people queried were government employees; 25.7% of workers in private sector companies, 18.3% of them were self-employed; 17.4% of them had their own business and the rest 22.6% of the sample fall under other categories. The collected samples reveal that, in terms of the mother tongue, most of the respondents that are 86.0% of them speak Tamil while 14.0% had another language as their mother tongue.

The case processing summary in Table 1 shows that 1000 cases were assigned to the training sample, 694 to the testing sample (306). The 0 cases excluded from the analysis are media awareness about the medical errors. The classification (Appendix Table A) shows the observed value of awareness of media, overall percent in training, 52.4% in which awareness, 63.3% is very high. In the testing sample of overall percent, 50% in which awareness of media in television is 64%. The classification (Appendix Table B) shows the observed value of media, overall percent in training, 66.1%. in which Television 36.7% is very high. In the testing sample of overall percent 50% in which awareness of

Table 1. Case processing summary.

		N	Percentage
Sample	Training	694	69.4
	Testing	306	30.6
Valid		1000	100.0
Excluded		0	
Total		1000	

Table 2. Overall percent correct.

Sample	Overall percent correct
Training	59.3
Testing	52.5

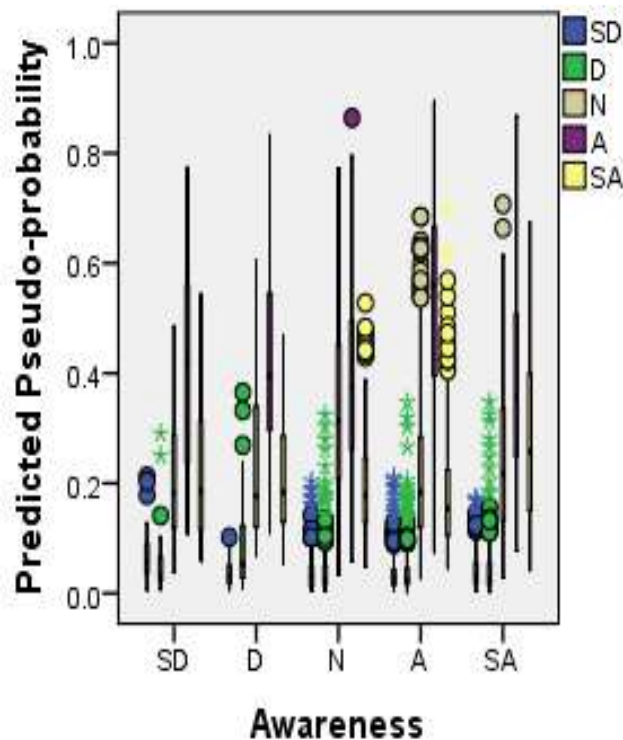


Figure 1. Observed chart of awareness.

media in television is 35.6%. Table 2 shows the overall percent of training, 59.3% and testing, 52.5%.

Predicted observed charts

The x axis corresponds to the observed response categories, and the legend corresponds to predicted categories (Figure 1). The leftmost box plot shows cases that have observed awareness powerfully disagree. The

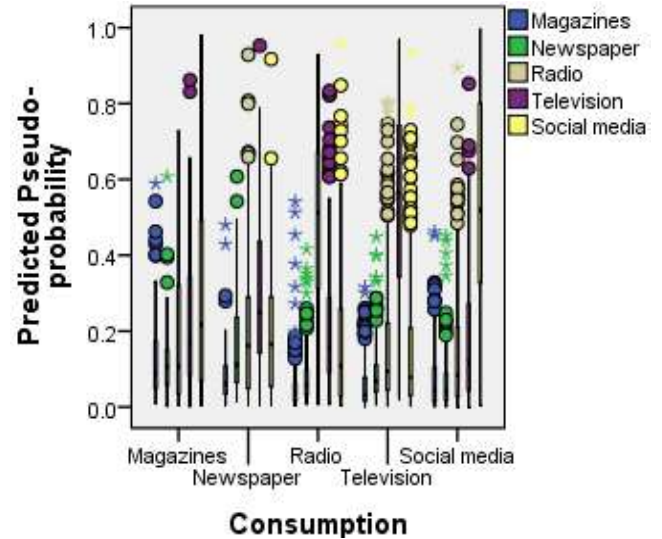


Figure 2. Observed chart of consumption.

predicted pseudo-probability of category strongly disagrees. Remember from the classification table that roughly as many Strongly disagree customers were misclassification as Agree as correctly classified as Strongly disagree; thus, this boxplot is roughly equivalent to the leftmost. As a result, interpreting this plot for targets with more than two categories can be difficult, because it is impossible to determine, from looking at a portion of cases in one box plot, the corresponding location of those cases in another box plot. Finally, awareness of media is agree 0.8 and strongly agree, 0.7 in predicted value.

The x axis corresponds to the observed response categories, and the legend corresponds to predicted categories (Figure 2). Remember from the classification table that roughly as many magazines were misclassified as radio as correctly classified as magazine; thus, this boxplot is roughly equivalent to the leftmost. The fourth boxplot shows, for cases that have observed Consumption Magazine, the predicted pseudo-probability of Consumption Television. As a result, interpreting this plot for targets with more than two categories can be difficult because it is impossible to determine, from looking at a portion of cases in one boxplot, the corresponding location of those cases in another boxplot. Finally, Consumption of media is Social Media 0.8 and television media 1.0 in predicted value

ROC curves

An ROC curve (Figure 3) gives a visual display of the sensitivity by specificity for all possible classification cutoffs. Finally, awareness of media is Agree 0.8 and strongly agree 0.9 in sensitivity value. An ROC curve (Figure 4) gives a visual display of the sensitivity by specificity for all possible classification cutoffs. Finally,

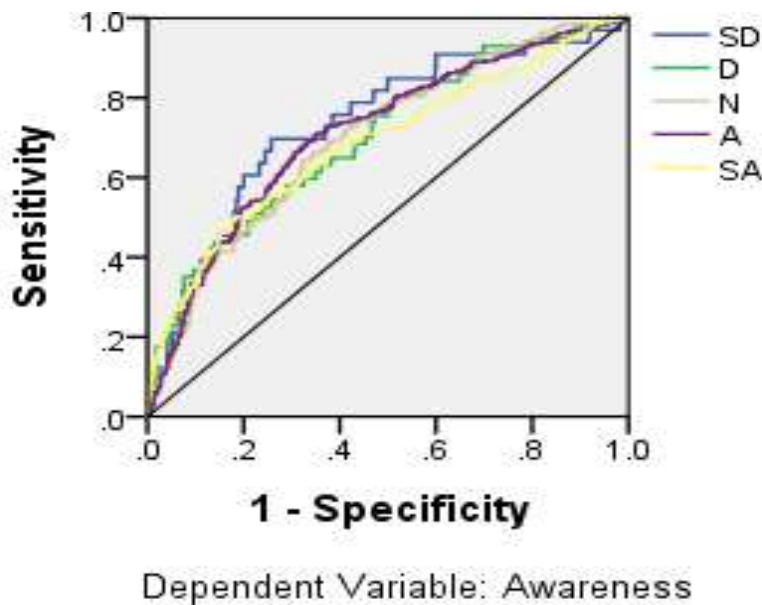


Figure 3. ROC curve of sensitivity.

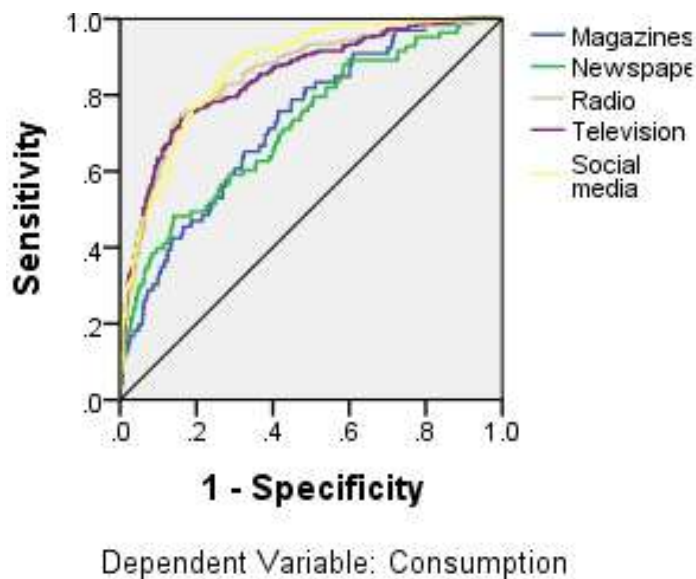


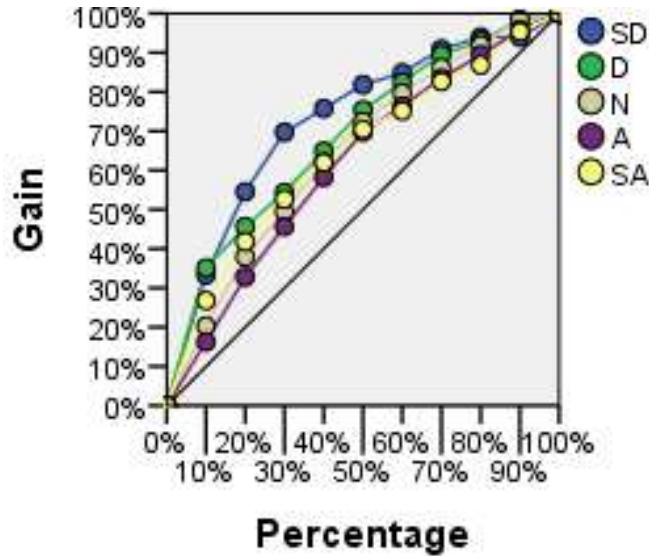
Figure 4. ROC curve of sensitivity.

consumption of media is social media 1.0 and television media is 1.0 in sensitivity value.

Cumulative gains charts

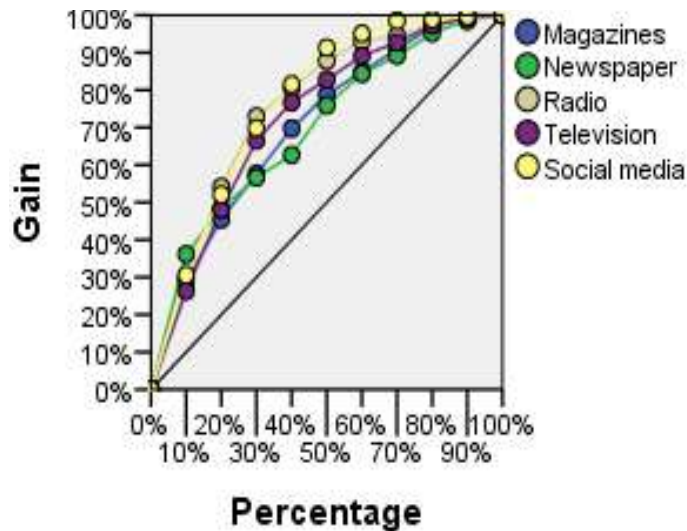
The first point on the curve for the Strongly agree category is approximate, meaning that if you score a dataset with the network and sort all of the cases by

predicted pseudo-probability of Strongly agree, we would expect the top 10% to contain approximately 20% of all of the cases that actually take the category Strongly agree. The diagonal line is the baseline curve; if you select 10% of the cases from the scored dataset at random, you would expect to gain approximately 10% of all of the cases that actually take any given category (Figure 5). Finally, awareness of media is disagree, 80% and strongly disagree, 90% in gain value. The first point on



Dependent Variable: Awareness

Figure 5. Cumulative gains charts of awareness.



Dependent Variable: Consumption

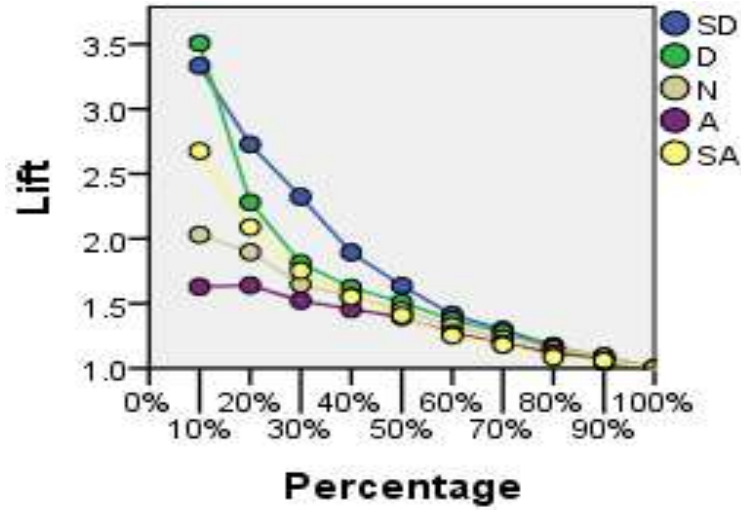
Figure 6. Cumulative gains charts of consumption.

the curve for the television category is approximate, meaning that if you score a dataset with the network and sort all of the cases by predicted pseudo-probability of television, we would expect the top 10% to contain approximately 20% of all of the cases that actually take the category Television. The diagonal line is the baseline curve; if you select 10% of the cases from the scored dataset at random, you would expect to gain

approximately 10% of all of the cases that actually take any given category (Figure 6). Finally, consumption of social media is 100% and television media is 90% in gain value.

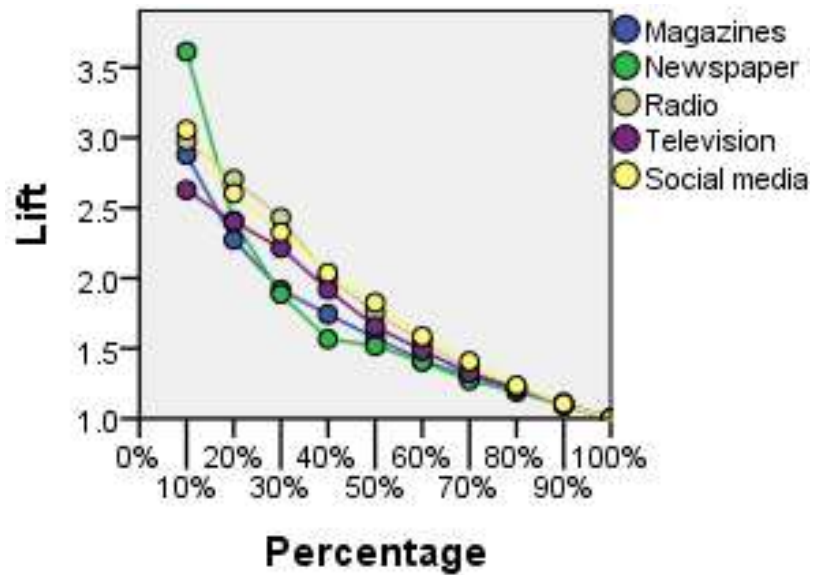
Lift charts

The lift chart is derived from the cumulative gains chart;



Dependent Variable: Awareness

Figure 7. Cumulative lift charts of awareness.



Dependent Variable: Consumption

Figure 8. Cumulative gains chart of consumption.

the values on the y axis correspond to the ratio of the cumulative gain for each curve to the baseline. Thus, the lift at 10% for the category strongly agree is approximately $20\%/10\% = 2.8$. It provides another way of looking at the information in the cumulative gains chart (Figure 7). Finally, Awareness of media is Disagree 3.5 and strongly disagree 3.4 in the lift value. The lift chart is

derived from the cumulative gains chart; the values on the y-axis correspond to the ratio of the cumulative gain for each curve to the baseline. Thus, the lift at 10% for the category Television is approximately $20\%/10\% = 2.8$. It provides another way of looking at the information in the cumulative gains chart (Figure 8). Finally, Consumption of Social Media is 3.0 and television media,

3.5 in lift value,

DISCUSSION

The study demonstrated that apparent helpfulness had the most grounded impact on positive goal to receive, trailed by the patients' history being globalized with cloud structure to maintain a strategic distance from the medicinal blunders (Hecker, and Domres, 2018). Nevertheless, usability had an extra circuitous effect on aim to receive through its solid impact on handiness. This recommends if open is to keep away from the restorative acts of neglect they should consider it to be in effect simple to utilize, and trust that it offers significant advantages over existing learning MLP model. In this way, planning a framework to report has appropriately and precisely pharmaceutical mistakes (Chen et al., 2018).

The attendant learners need to enhance the quality of reporting drug mistakes or more in all setting. Pharmaceutical mistakes brought on by the unreliability of patients to get some answers to the data, the control framework can be enhanced to identify hoodlums (Alsubaie et al., 2018). The concentrate likewise demonstrated that the impact of expertise and involvement with the globalized therapeutic framework on the reception of cloud structure has interceded through the effect of handiness and convenience. This recommends being open to a noteworthy level of involvement and more propelled elements of the globalized therapeutic framework will be both happy utilizing it for learning and see the advantages it offers in supporting their field of restorative calling by ICT aptitude (Kunda et al., 2018). It was found that with open skillful fundamental media clients will probably receive medicinal awareness.

The study demonstrated that media effects will probably see new innovation as great and adoptable later on. While setting up general society for medicinal awareness, a more extensive center is required on how media is upheld and presented. The public should know that an essential level of media ability is prescribed before the general population is acquainted with restorative awareness (Kenneth, 2012). Since a number of the exercises completed on a therapeutic gadget have additionally attempted one PC, it might be useful to figure out how to adequately do on cloud structure before advancing to a restorative domain (Prayag, 2016).

Conclusion

The aim of this research is to carry out an empirical analysis of the factors determining patients affected from medical related errors and influence of television media, medical malpractice, awareness in hospitals considering seven factors such as reliability, reason, conception,

consumption, awareness, demands and requisition pertaining to model, using an MLP model (Moreira, 2018; Ravichandran and Arulchelvan, 2017). The findings show that the television media slightly deviated from their known path of entertainment and started spreading awareness of the medical malpractices (Monroe, 2013). The news of the medical malpractices has started hitting the headlines in the daily news bulletins of the television media. In this paper, another strategy for positioning the significance of elements for an MLP has been produced (Parsaei et al., 2017; Lemoyne and Mastroianni, 2016). The media awareness has been demonstrated observationally to be both predictable and valuable. At the point when contrasted and the customary strategy for positioning information highlights by the likelihood of mistake model, it executed also and brought about a comparable positioning for the info highlights. Likewise, the back spread was contrasted with expanded common sifting utilizing the media awareness. It was found that both techniques for setting the weights in an MLP place relative accentuations on the components (Zhang, 2016). One expansion of the saliency measure is its application for the shrouded hubs of a multilayer discernment. The yields of the shrouded hubs are inputs to the accompanying layer; subsequently, the saliency of the concealed hubs can likewise be processed. The continuous examination into this region will, ideally, give a strategy to naturally measure the shrouded layers in a multilayer recognition.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

REFERENCES

- Alsubaie M, Cooper J, Waring J, Carson-Stevens A, Boyd MJ (2018). Oral abstracts patient safety incidents. *International Journal of Pharmacy Practice* 26(1):4-36.
- Angell M (1997). *Science on trial: the clash of medical evidence and the law in the breast implant case*. WW Norton & Company.
- Berg A, Ryymin T (2018). The people's health, the nation's health, the world's health: *Folkhälsa and folkehelse in the writings of Axel Höjer and Karl Evang*. In *Conceptualising Public Health* pp. 76-100. Routledge.
- Chen X, Cai X, Liang J, Liu Q (2018). Ensemble learning multiple LSSVR with improved harmony search algorithm for short-term traffic flow forecasting. *IEEE Access* 6:9347-9357.
- Danzon PM (1985). *Medical malpractice: Theory, evidence, and public policy*. Harvard University Press.
- De Domenico M, Porter MA, Arenas A (2015). MuxViz: A tool for multilayer analysis and visualization of networks. *Journal of Complex Networks* 3(2):159-176.
- Deveugele M, Derese A, van den Brink-Muinen A, Bensing J, De Maeseneer J (2002). Consultation length in general practice: cross sectional study in six European countries. *Brmj*, 325(7362):472.
- Economic Times (2017). Less than one doctor for 1000 population in India: Government to Lok Sabha Jul 21, 2017 Read more at://economictimes.indiatimes.com/articleshow/59697608.cms
- Gerbner G (1967). Mass media and human communication theory. *Human communication theory* pp. 40-57.

- Graber DA, Dunaway J (2017). Mass media and American politics. Cq Press.
- Gupta B (1976). Indigenous medicine in nineteenth and twentieth century Bengal. *Asian medical systems: A comparative study* p. 368-78.
- Hecker N, Domres BD (2018). The German emergency and disaster medicine and management system-history and present. *Chinese journal of traumatology*.
- Kirby E, Broom A, Gibson A, Broom J, Yarwood T, Post J (2018). Medical authority, managerial power and political will: A Bourdieusian analysis of antibiotics in the hospital. *Health* 22(5):500-518.
- Kunda D, Chembe C, Mukupa G (2018). Factors that influence Zambian higher education lecturer's attitude towards integrating ICTs in teaching and research. *Journal of Technology and Science Education* 8(4):360-384.
- Lemoyne R, Mastroianni T (2016). Implementation of a smartphone as a wireless gyroscope platform for quantifying reduced arm swing in hemiplegic gait with machine learning classification by multilayer perceptron neural network (2016) Proceedings of the Annual International Conference of the IEEE Engineering in Medicine and Biology Society, EMBS 7591269:2626-2630.
- Lindsay CM (2018). *New Directions in Public Health Care: A Prescription for the 1980's*. Routledge.
- Linehan MM (2018). *Cognitive-behavioral treatment of borderline personality disorder*. Guilford Publications.
- Mannucci E, Petroni ML, Villanova N, Rotella CM, Apolone G, Marchesini G (2010). Clinical and psychological correlates of health-related quality of life in obese patients. *Health and quality of life outcomes* 8(1):90.
- Moreira MWL, Rodrigues JJPC, Kumar N, Al-Muhtadi J, Korotaev V (2018). Nature-Inspired Algorithm for Training Multilayer Perceptron Networks in e-health Environments for High-Risk Pregnancy Care *Journal of Medical Systems* 42(3):51. <https://www.scopus.com/inward/record.uri?>
- Nabi RL, Sullivan JL (2001). Does television viewing relate to engagement in protective action against crime? A cultivation analysis from a theory of reasoned action perspective. *Communication Research* 28(6):802-825.
- Narlawar UW, Lilare RR, Nisal K (2018). A comparative study on maternal mortality at government medical college, nagpur. *Indian Journal Applied Research* 8(1).
- Parsaei H, Faraz M, Mortazavi SMJ (2017). A Multilayer Perceptron Neural Network-Based Model for Predicting Subjective Health Symptoms in People Living in the Vicinity of Mobile Phone Base Stations (2017) *Ecopsychology* 9(2):99-105.
- Popkin BM, Adair LS, Ng SW (2012). Global nutrition transition and the pandemic of obesity in developing countries. *Nutrition Reviews* 70(1):3-21.
- Prayag A, Ashtagi GS, Mallapur MD (2016). Pattern of poisoning cases at a tertiary health-care center, Belagavi. *International Journal of Medical Science and Public Health* 5(8):1698-701.
- Radsky A (2013). *Re-Evaluating the Public Sphere in Russia: Case Studies of Two NGOs* (Doctoral dissertation, The Ohio State University).
- Ravichandran K, Arulchelvan S (2016). The approach of Bayesian model indicates media awareness of medical errors. In *AIP Conference Proceedings* AIP Publishing 1751(1): 020006.
- Ravichandran K, Arulchelvan S (2017). The model of multilayer perceptron analysed the crime news awareness in India (quantitative analysis method) 2017 4th International Conference on Advanced Computing and Communication Systems, ICACCS 2017, art. no. 8014620.
- Ushie BA, Salami KK, Jegede AS, Oyetunde M (2013). Patients' knowledge and perceived reactions to medical errors in a tertiary health facility in Nigeria. *African Health Sciences* 13(3):820-828.
- Zhang Y, Sun Y, Phillips P, Liu G, Zhou X, Wang S (2016). A multilayer perceptron based smart pathological brain detection system by fractional Fourier entropy. *Journal of Medical Systems* 40(7):173.

Appendix Table A. Classification awareness.

		Awareness					
Sample	Observed	Predicted					Percent correct (%)
		SD	D	N	A	SA	
Training	SD	0	0	7	18	3	0.0
	D	0	2	6	22	3	6.1
	N	0	2	84	90	14	44.2
	A	0	1	38	234	19	80.1
	SA	0	2	30	75	44	29.1
	Overall Percent	0.0%	1.0%	23.8%	63.3%	12.0%	52.4
Testing	SD	0	0	2	3	0	0.0
	D	0	0	7	16	1	0.0
	N	0	0	27	40	4	38.0
	A	0	1	23	108	12	75.0
	SA	0	0	14	30	18	29.0
	Overall Percent	0.0%	0.3%	23.9%	64.4%	11.4%	50.0

Appendix B. Classification consumption.

		Consumption					
Sample	Observed	Predicted					Percent correct (%)
		Magazines	Newspaper	Radio	Television	Social media	
Training	Magazines	7	1	9	14	13	15.9
	Newspaper	1	11	10	27	15	17.2
	Radio	1	4	130	20	22	73.4
	Television	0	3	27	173	22	76.9
	Social media	2	4	19	21	138	75.0
	Overall Percent	1.6%	3.3%	28.1%	36.7%	30.3%	66.1
Testing	Magazines	1	2	7	5	7	4.5
	Newspaper	1	0	9	5	4	0.0
	Radio	4	2	43	12	17	55.1
	Television	0	0	12	71	23	67.0
	Social media	0	1	11	16	53	65.4
	Overall Percent	2.0%	1.6%	26.8%	35.6%	34.0%	54.9