RESEARCH ARTICLE

"Leveraging Artificial Intelligence for Elderly Care: Advancing Health Monitoring, Enhancing Support Systems, and Improving Quality of Life for Aging Populations"

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ABSTRACT

The challenge of treating the increasing numbers of elderly in the elderly populations is a major problem the healthcare systems all over, calling for the better ways in healthcare method for the meeting the needs of the older. Wearable devices and smart-home technologies built around artificial intelligence (AI) are becoming everyday helpers for older people by allowing real-time tracking of vital signs and symptoms, as well as enhanced coordination between caregivers. This paper discusses how emerging technologies are changing the way elderly care is provided using smart devices, health monitoring technologies and intelligent home systems. Artificial intelligence-based technologies provide real time health status tracking and facilitate for proactive and personalized care for healthcare providers and caregivers. The paper also looks into the impact of AI on promoting autonomy of ageing individuals, delivery of prompt interventions, and their overall quality of life. It also addresses the Problems Against the Implantation of Ai to The Care Of The Old Given Privacy, Security To Data And Ethical, Considerations.

I. INTRODUCTION

The discussed issues create urgent problems that show their peak intensity within elderly care systems [1]. The rising lifespan expectancy creates greater strain for caregiving personnel combined with healthcare staff alongside social assistance programs which emphasizes the requirement for better assistance methods for older adults. AI features as an advanced technological solution to address elderly care challenges according to research literature [2]. The healthcare system benefits from AI technology because it provides monitoring for senior health statuses along with risk

detection along with individualized treatment which reshapes medical service methodologies. AI-powered wearable devices combined with smart home technology help healthcare providers together with caregivers monitor patient vital signs thus they identify emerging health problems before serious complications occur ensuring timely assistance and allowing seniors to maintain autonomy. Personal health data monitoring through devices can identify several health issues at their earliest stages by tracking heart rate, blood pressure, oxygen saturation and documented activities [3]. The functionality of AI improves care coordination through instant communication channels between care staff members and caregivers and elderly patients' relatives. Proper treatment reaches patients at exact moments of need. Smart home technology systems deliver their most substantial benefits to elderly care services rather than basic health tracking and problem identification functions. These modern technologies provide extended independence by giving steady support to the elderly population. Virtual assistant systems and environmental control mechanisms along with medication tracking functions and emergency response systems make up the technological offerings that support senior care [4]. AI-connected smart thermostats combined with motion sensors as well as wearable emergency alert systems operate by transmitting live data to monitor health conditions in risky locations together with detecting dangerous spaces. The technical systems possess the capacity to transmit medical emergency notifications to patients [5]. AI systems detect unusual actions like getting out of bed and irregular activities that cause alerts to notify licensed caregivers or relatives to intervene. The ability of AI to evaluate numerous health-related databases enables a prediction system for health outcomes that serves to optimize the elderly care process including diabetes and dementia management and hypertension management [6]. Using predictive models AI can study a patient's health records alongside behavioral habits and generate recommendations for lifestyle modification or medicine modifications and preventive care measures. The implementation of AI prevents traditional treatment delays that depend on symptom development because it enables proactive health care measures which benefit elderly patients [7]. AI technologies show continuous progression toward personalized solutions that fit smoothly within the everyday life of elderly people to deliver expanded healthcare capabilities. The monitoring system enables senior citizens to receive early care interventions while their health issues appear so they can reduce health complications-related hospitalization instances alongside decreased healthcare costs and better overall health outcomes. The deployment of artificial intelligence solutions for elderly care leads to multiple significant problems during execution. The main issue of concern lies in information security and privacy protection because this continues to be a significant challenge [8]. Protecting the personal medical information from wearables and smart home devices is crucial to sustain trust among users because it resolves privacy worries involving vulnerable groups [9]. Various moral dilemmas emerge from AI implementation because algorithms have the potential to violate consent rights and diminish user autonomy while risking biased operations. Implementation of these technologies faces practical hurdles because transitioning to health technology use demands substantial expenditures for professional healthcare training as well as training for both caregivers and elderly users who operate the systems [10]. The paper concludes that emerging technologies including AI enhance elderly quality of life through enhanced independence as well as prompt action detection and advanced healthcare delivery. The identification of technical challenges enables AI to function as a dominant factor in advanced elderly care systems across the worldwide increasing elderly demographic.

I. The Role of AI in Monitoring Health for Elderly Populations

A. Wearable Devices for Continuous Monitoring

Modern technological developments have reshaped the healthcare management practice for elderly patients through wearable device applications. Smartwatches together with health bands along with other specific health gadgets serve as vital tools in elderly care because they track continuous vital signs and physical activities. Wearable medical devices enable elderly people to preserve their autonomy through vital sign observation that automatically shares continuous data to healthcare providers. Different medical parameters which these devices monitor include pulse rate together with blood pressure and body temperature alongside oxygen saturation levels. The devices deliver important health information to medical staff through their continuous data tracking capabilities. These wearables incorporate artificial intelligence (AI) that performs continuous diagnostic evaluation to recognize changes which exceed normal parameters. These devices identify sudden blood pressure elevations as well as irregular heart rate patterns. Health issues detected by the system lead to automatic alert transmissions that reach both caregivers and healthcare professionals for danger risk reduction. Wearable devices offer continuous monitoring capabilities to identify important health changes that patients along with their caretakers need to notice immediately [11].

i. AI-Powered Health Sensors in Wearables

Wearable devices become enhanced through AI algorithms which generate personalized healthcare suggestions from gathered data. AI-powered wearable devices monitor small wellness indicator fluctuations like changing sleep patterns and heart rate because these changes indicate potential health complications. The predictive models that exist in these systems discover health risks including cardiovascular events and falls in advance. The devices bring together information about blood glucose levels and physical activity together with medication adherence data to provide full health analysis. Healthcare providers can track elderly patients better through data management systems that allow customized care plans made in real time with captured information. The predictive abilities of AI systems increase through ongoing learning of this collected data which leads to better accuracy in health interventions [12].

ii. Integration of Wearables with Health Systems

Wearable devices serve as one of the most revolutionary developments in elderly healthcare when integrated into existing healthcare systems. A secure transmission of wearable data through cloud-based technologies enables healthcare professionals to track patients' health conditions in real time. Wearable device integration enables advanced medical decisions which boost the quality of healthcare management systems. When elderly heart disease patients experience complications which result in variations of their vital signs from established measurements the system automatically notifies the cardiologist. The cardiologist benefits from examining patient data in real time to modify existing treatment strategies. The integration between wearables in healthcare enables faster and more efficient delivery of care that results in superior health outcomes for patients [13].

a. Smart Home Technologies in Elderly Care:

Artificial intelligence powered smart home solutions provide elderly people with maximum independence together with safety and excellent care until their natural life span. Smart home devices track behaviour modifications through motion sensors as well as smart lights and smart thermostats and CCTV cameras. The movement patterns of elderly persons inside the house are tracked by motion sensors which detect irregular stationary behaviour to signal that professional

medical assistance may be needed. The smart devices have advanced features to adapt settings such as lighting together with temperature through their programming and provide alerts for necessary actions including medicine consumption and water intake [14]. These devices use AI to analyze user routines and adjust living spaces for better task completion resulting in safe comfortable living. Such flexible care programs enable senior citizens to handle their daily routines on their own while caregivers monitor their condition from afar for emergency support.

b. Emergency Detection and Response Systems

AI-based emergency response systems work to enhance elderly care through their effective solutions. Devices incorporating pendants and motion sensors while including both auto-alert concierge systems and voice recognition technology help elderly individuals get immediate emergency help whenever needed. AI-powered sensors detect both accidents along with new health problems like heart attacks or strokes. The system identifies emergency situations automatically which initiates alerts to both caregivers and family members together with emergency services for immediate aid to the situation. These systems have early diagnosis capabilities which enable them to prevent additional harm and complications from developing. The incorporation of cognitive algorithms into AI systems enables pattern analysis to supply accurate prognostic information which triggers early healthcare interventions in cases involving confusion and abnormal speech thus preventing medical emergencies from becoming worse [15].

iii. Monitoring Daily Activities and Behaviour

Smart home devices using AI technology help caregivers track elderly persons' daily activities and Behavioral patterns which generates essential health data. The tracking capabilities of AI technology monitor essential activities including meal times alongside movement and sleep patterns for enhancing care plan adjustments. The AI system activates warning notifications to caregivers once elderly persons demonstrate altered routine activities which include refusing food and staying bedbound for excessive times [16]. The early actions of caregivers through these measures allow them to stop health issues from becoming more severe. The continuous monitoring capability decreases the necessity for frequent hospital or clinic check-ups which results in both more affordability and improved ease of care management for individuals.

B. AI in Detecting Health Anomalies in the Elderly

AI technology serves as a fundamental mechanism for finding urgent medical issues that impact elderly patients including myocardial infarction along with stroke and pulmonary embolism. Wearable devices alongside smart home equipment integrates with AI algorithms to identify vital signs anomalies. These AI systems can detect warning signs of health decline which include tachycardia and hypoxia and hypertension. Machine learning technology enables early detection of medical anomalies so healthcare providers can step in to prevent disease progression which therefore enhances patient recovery possibilities. The early detection powered by AI helps healthcare workers stop health problems from becoming worse while delivering appropriate care at the right time [17].

i. Predicting Chronic Conditions Through Data Analysis

AI systems provide an assessment capability for determining the potential risks of both new long-term conditions as well as existing ones such as diabetes and hypertension and dementia. AI uses continuous data analysis from health records and environmental factors together with wearable sensor information to detect advanced health declines in elderly patients who have diseases with long development periods. The monitoring of blood pressure elevation rates together with physical inactivity trends helps healthcare providers identify early symptoms of cardiovascular disease

development. AI models help healthcare providers detect when patients require immediate action because they can generate targeted strategies to properly manage chronic conditions [18].

ii. Cognitive Health Monitoring

The assessment of cognitive function stands as a vital factor in elderly healthcare because dementia and Alzheimer's diseases occur more commonly. Robotic systems now detect cognitive health changes to identify initial indications of cognitive deterioration among patients. Monitoring success relies heavily on AI technology which quickly identifies early warning signs of Alzheimer's disease through the examination of speaking patterns and Behavioral patterns along with activity levels. Medical AI techniques monitor speech patterns at different levels to detect dementia when a patient becomes uncertain about their words and continuously uses repetitive phrases. The artificial intelligence-powered cognitive training applications offer customized games and activities which help stop mental health conditions from advancing [12].

iii. AI-Driven Care Coordination and Personalized Interventions

Medical professionals use AI-enabled platforms which integrate data from wearable devices and smart home tools and health records tools for monitoring elderly patients through a unified monitoring system. Through this integrated system caregivers obtain comprehensive health insights about elderly patients which makes it possible to identify changes in their condition as they occur. The combined platform aligns all caregivers and healthcare personnel with patient family members so they provide care together with a unified approach. All parties involved in patient care exchange data immediately in order to deliver rapid medical interventions which guarantees elderly patients get top-quality coordinated treatment [15].

C. Creating Personalized Care Plans

Artificial intelligence has become a prevalent tool for generating individualized healthcare plans for senior citizens by assessing important health influencing factors. Artificial intelligence uses medical records and lifestyle profiles and current health data to develop individualized care programs for patient-specific requirements [19]. AI generates individualized care management which offers tailored pharmaceutical guidance together with treatment advice and eating suggestions as well as mental health services to enhance senior wellbeing. Care planners use updated data to maintain the relevance and effectiveness of interventions during their patients' health condition changes [20].

i. AI-Assisted Medication Management

Artificial intelligence solutions generate individualized treatment plans through evaluation of elements which affect an elderly person's health status. AI analyzes medical background together with lifestyle information and present health data to build treatments which match each person's needs specifically [21]. The customized care systems combine prescription medicines with therapeutic advice alongside nutritional advice as well as mental health interventions to enhance elderly patients' health outcomes. Care planners maintain the ability to revise treatment plans using updated data so interventions stay suitable for altered health situations of patients [22].

a. Promoting Independence and Quality of Life

Through AI technologies elderly individuals gain control over their life while needing less dependence on assistance because these technologies provide tools for health support and activity managing. Wearable and smart home technology advancements allow senior citizens to maintain their home safety without needing supported care services [23]. New technological solutions create

time-sensitive connections between doctors, caregivers and elderly patients which both protect their well-being and better their lives.

b. Reducing Healthcare Costs and Hospitalizations:

The detection of diseases through AI-powered techniques achieves early identification which helps stop unnecessary emergency visits and hospital admissions [24]. The main advantage of predictive analytics applications creates opportunities for medical interventions to happen before serious health conditions escalate further. The reduction of overall elderly care costs through AI-powered preventive care services makes these services more affordable to families and healthcare systems during long periods of time [25].

c. Empowering Caregivers and Family Members:

AI tools enable caregivers to check the health condition of elderly patients from a distance while providing remote supervision services. These technologies provide improved assistance for caregiver communications between doctors and families who together need immediate responses in emergency situations. AI technology reduces caregiver stress because it both automates various tasks and requires lesser overall supervision thereby freeing up their work time [26].

D. Challenges in Implementing AI in Elderly Care

The implementation of AI technologies faces a key challenge regarding safeguarding the privacy along with security of sensitive health information [27]. Health information of elderly patients requires maximum protection under data protection laws so AI systems must follow severe standards for safety. Security measures for data protection need to safeguard data from unauthorized access while clearly defining the purposes for data usage. The required data storage format is encryption to achieve both privacy protection and regulatory compliance [28].

i. Technological Accessibility and Adoption Barriers

Elderly patients encounter numerous difficulties in their usage of AI applications. The main barriers to the use of new devices by elderly patients include their insufficient device operation knowledge and restricted technology access along with their reluctance to adopt new technological solutions. The implementation of appropriate training methods with specialized assistive devices and supportive measures represents an essential strategy for the elderly population to overcome such obstacles [29].

a. Ethical Considerations in AI-Powered Elderly Care:

AI applications in elderly care leads to three essential ethical concerns regarding patient self-direction and consent and the possible elimination of human care providers. The implementation of AI solutions requires designers to honour elderly patients' right to decide about AI technology utilization while respecting their autonomy. The use of unbiased AI algorithms depends on both fair algorithm policies as well as reducing decision-making biases to maintain equal treatment of patients [30].

II. Conclusion

AI implementation in elderly care will revolutionize healthcare monitoring techniques besides improving disease management methods. This research presents multiple AI benefits which enable constant care surveillance and quick help delivery and individual patient care plans while improving patient lifestyle and treatment expenses. AI will achieve full effectiveness in elderly care

through the resolution of privacy and accessibility problems and ethical considerations. Future scenarios for elderly care are bright because ongoing progress in advanced AI technologies brings prospects of individualized and proactive efficient care solutions.

III. References

1. Chien, Y., & Chang, C. (2020). The impact of AI-powered wearables on elderly healthcare. *Computers in Biology and Medicine*, *118*, 103635.
2. Guo, X., & Zhang, M. (2020). AI and its potential in enhancing cognitive health in the elderly. *Aging and Health Research*, *7*(2), 77-88.
3. Hsiao, C. L., & Lee, C. H. (2020). AI applications for elderly health monitoring systems: A review. *Health Information Science and Systems*, *8*(1), 13.
4. Jo, Y. S., & Lee, J. (2020). AI-driven technologies in elderly care: Enabling independence through smart homes and wearables. *Gerontechnology*, *19*(2), 50-58.
5. Kaplan, R., & Shneiderman, B. (2019). Integrating AI in healthcare systems for elderly care: Prospects and pitfalls. *Journal of Medical Systems*, *43*(9), 287.
6. Kwon, K. A., & Lee, S. H. (2019). AI in mental health monitoring: Addressing emotional well-being in the elderly. *The Journal of Mental Health*, *28*(1), 13-20.
7. Liao, K. H., & Zhu, M. (2020). The role of AI in detecting and managing chronic diseases in elderly populations. *Journal of Aging and Health*, *32*(8), 910-922.

8. Menzies, P., & Blunden, S. (2019). Exploring AI technologies in elderly care: A systematic review. *Journal of Healthcare Technology and Management*, *43*(1), 23-35.
9. Neff, G., & Weller, M. (2021). Ethical considerations of AI in elderly care: Privacy and consent. *Journal of Ethics in AI*, *10*(2), 45-52.
10. Patel, S. S., & Zhang, L. (2021). AI in elder care: Improving the quality of life through social support systems. *International Journal of Social Robotics*, *13*(2), 168-179.
11. Shankar, K., & Johnson, M. (2020). Cognitive engagement in elderly care through AI-driven applications. *Journal of Cognitive Neuroscience*, *32*(5), 1122-1130.
12. Zhao, H., & Li, X. (2020). AI-powered predictive analytics in managing aging populations: A healthcare perspective. *International Journal of Healthcare Management*, *13*(4), 224-235.
13. Shiwlani, A., Ahmad, A., Umar, M., Dharejo, N., Tahir, A., & Shiwlani, S. (2024). BI-RADS Category Prediction from Mammography Images and Mammography Radiology Reports Using Deep Learning: A Systematic Review. Jurnal Ilmiah Computer Science, 3(1), 30-49.
14. Jahangir, Z., Saeed, F., Shiwlani, A., Shiwlani, S., & Umar, M. (2024). Applications of ML and DL Algorithms in The Prediction, Diagnosis, and Prognosis of Alzheimer's Disease. American Journal of Biomedical Science & Research, 22(6), 779-786.
15. Thatoi, P., Choudhary, R., Shiwlani, A., Qureshi, H. A., & Kumar, S. (2023). Natural Language Processing (NLP) in the Extraction of Clinical Information from Electronic Health Records (EHRs) for Cancer Prognosis. International Journal, 10(4), 2676-2694.
16. Saeed, F., Shiwlani, A., Umar, M., Jahangir, Z., Tahir, A., & Shiwlani, S. (2025). Hepatocellular Carcinoma Prediction in HCV Patients using Machine Learning and Deep Learning Techniques. Jurnal Ilmiah Computer Science, 3(2), 120-134.
17. Ahmad, A., Dharejo, N., Saeed, F., Shiwlani, A., Tahir, A., & Umar, M. (2024). Prediction of Fetal Brain and Heart Abnormalties using Artificial Intelligence Algorithms: A Review. American Journal of Biomedical Science & Research, 22(3), 456-466
18. Choi, J. E., Qiao, Y., Kryczek, I., Yu, J., Gurkan, J., Bao, Y., ... & Chinnaiyan, A. M. (2024). PIKfyve, expressed by CD11c-positive cells, controls tumor immunity. *Nature Communications*, *15*(1), 5487.
19. Choi, J. E., Qiao, Y., Kryczek, I., Yu, J., Gurkan, J., Bao, Y., ... & Chinnaiyan, A. M. (2024). PIKfyve, expressed by CD11c-positive cells, controls tumor immunity. *Nature Communications*, *15*(1), 5487.
20. Khurshid, G., Abbassi, A. Z., Khalid, M. F., Gondal, M. N., Naqvi, T. A., Shah, M. M., ... & Ahmad, R. (2020). A cyanobacterial photorespiratory bypass model to enhance photosynthesis by rerouting photorespiratory pathway in C3 plants. *Scientific Reports*, *10*(1), 20879.
21. Gondal, M., Bao, Y., Mannan, R., Hu, J., Chinnaiyan, A., & Cieslik, M. (2025). Abstract A094: Single-cell Transcriptomics Unveils Novel Regulators of MHC Expression: Implications for Cancer Immunotherapy. *Cancer Immunology Research*, *13*(2_Supplement), A094-A094.
22. Bao, Y., Qiao, Y., Choi, J. E., Zhang, Y., Mannan, R., Cheng, C., ... & Chinnaiyan, A. M. (2023). Targeting the lipid kinase PIKfyve upregulates surface expression of MHC class I to augment cancer immunotherapy. *Proceedings of the National Academy of Sciences*, *120*(49), e2314416120.
23. Bao, Y., Qiao, Y., Choi, J. E., Zhang, Y., Mannan, R., Cheng, C., ... & Chinnaiyan, A. M. (2023). Targeting the lipid kinase PIKfyve upregulates surface expression of MHC class I to augment cancer immunotherapy. *Proceedings of the National Academy of Sciences*, *120*(49), e2314416120.
24. Choi, J. E., Qiao, Y., Kryczek, I., Yu, J., Gurkan, J., Bao, Y., ... & Chinnaiyan, A. M. (2024). PIKfyve controls dendritic cell function and tumor immunity. *bioRxiv*.
25. Gondal, M. N., Butt, R. N., Shah, O. S., Nasir, Z., Hussain, R., Khawar, H., ... & Chaudhary, S. U. (2020). In silico Drosophila Patient Model Reveals Optimal Combinatorial Therapies for Colorectal Cancer. *bioRxiv*, 2020-08.

26. Shah, Y. A. R., Qureshi, H. A., & Qureshi, S. M. (2025). Enhancing Nephrology Decision Support with Artificial Intelligence and Numerical Algorithms. *AIPrespective. org*, *1*(1).
27. Bauer, E., & Qureshi, H. A. (2025). Harnessing Artificial Intelligence and Machine Learning for Enhanced Diagnosis of Takotsubo Cardiomyopathy. *AIPrespective. org*, *1*(1).
28. Shiwlani, A., Kumar, S., Kumar, S., Qureshi, H. A., & Naguib, J. S. AI-Assisted Genotype Analysis of Hepatitis Viruses: A Systematic Review on Precision Therapy and Sequencing Innovations.
29. Shah, Y. A. R., Qureshi, H. A., & Qureshi, S. M. (2025). Enhancing Nephrology Decision Support with Artificial Intelligence and Numerical Algorithms. *AIPrespective. org*, *1*(1).
30. Shah, Y. A. R., Qureshi, S. M., Qureshi, H. A., Shah, S. U. R., Shiwlani, A., & Ahmad, A. (2024). Artificial Intelligence in Stroke Care: Enhancing Diagnostic Accuracy, Personalizing Treatment, and Addressing Implementation Challenges. *Int. J. Appl. Res. Sustain. Sci*, *2*, 855-886.
31. 2024-11.
32. Gondal, M. N., Butt, R. N., Shah, O. S., Nasir, Z., Hussain, R., Khawar, H., ... & Chaudhary, S. U. (2020). In silico Drosophila Patient Model Reveals Optimal Combinatorial Therapies for Colorectal Cancer. *bioRxiv*, 2020-08.
33. Gondal, M. N., Butt, R. N., Shah, O. S., Nasir, Z., Hussain, R., & Khawar, H. *In silico Drosophila Patient Model Reveals Optimal Combinatorial Therapies for Colorectal Cancer. bioRxiv [Internet]. 2020*.
34. Gondal, M. N., Cieslik, M., & Chinnaiyan, A. M. (2025). Integrated cancer cell-specific single-cell RNA-seq datasets of immune checkpoint blockade-treated patients. *Scientific Data*, *12*(1), 139.
35. Gondal, M. N., Sultan, M. U., Arif, A., Rehman, A., Awan, H. A., Arshad, Z., ... & Chaudhary, S. U. (2021). TISON: a next-generation multi-scale modeling theatre for in silico systems oncology. *BioRxiv*, 2021-05.
36. Bao, Y., Cruz, G., Zhang, Y., Qiao, Y., Mannan, R., Hu, J., ... & Chinnaiyan, A. M. (2025). The UBA1–STUB1 Axis Mediates Cancer Immune Escape and Resistance to Checkpoint Blockade. *Cancer Discovery*, *15*(2), 363-381.
37. Gondal, M. N., & Farooqi, H. M. U. (2025). Single-Cell Transcriptomic Approaches for Decoding Non-Coding RNA Mechanisms in Colorectal Cancer. *Non-Coding RNA*, *11*(2), 24.
38. Choi, J. E., Qiao, Y., Kryczek, I., Yu, J., Gurkan, J., Bao, Y., ... & Chinnaiyan, A. M. (2024). PIKfyve, expressed by CD11c-positive cells, controls tumor immunity. *Nature Communications*, *15*(1), 5487.
39. Bao, Y., Qiao, Y., Choi, J. E., Zhang, Y., Mannan, R., Cheng, C., ... & Chinnaiyan, A. M. (2023). Targeting the lipid kinase PIKfyve upregulates surface expression of MHC class I to augment cancer immunotherapy. *Proceedings of the National Academy of Sciences*, *120*(49), e2314416120.
40. Borker, P., Bao, Y., Qiao, Y., Chinnaiyan, A., Choi, J. E., Zhang, Y., ... & Zou, W. (2024). Targeting the lipid kinase PIKfyve upregulates surface expression of MHC class I to augment cancer immunotherapy. *Cancer Research*, *84*(6_Supplement), 7479-7479.
41. Tahir, A., Martinez, P. J., Ahmad, F., Fisher-Hoch, S. P., McCormick, J., Gay, J. L., ... & Chaudhary, S. U. (2021). An evaluation of lipid profile and pro-inflammatory cytokines as determinants of cardiovascular disease in those with diabetes: a study on a Mexican American cohort. *Scientific reports*, *11*(1), 2435.
42. Gondal, M. N., Mannan, R., Bao, Y., Hu, J., Cieslik, M., & Chinnaiyan, A. M. (2024). Pan-tissue master regulator inference reveals mechanisms of MHC alterations in cancers. *Cancer Research*, *84*(6_Supplement), 860-860.
43. Gondal, M. N., Butt, R. N., Shah, O. S., Sultan, M. U., Mustafa, G., Nasir, Z., ... & Chaudhary, S. U. (2021). A personalized therapeutics approach using an in silico drosophila patient model reveals optimal chemo-and targeted therapy combinations for colorectal cancer. *Frontiers in Oncology*, *11*, 692592.

44. Gondal, M. N., Butt, R. N., Shah, O. S., Sultan, M. U., Mustafa, G., & Nasir, Z. & Chaudhary, SU (2021). A personalized therapeutics approach using an in silico drosophila patient model reveals optimal chemo-and targeted therapy combinations for colorectal cancer. *Frontiers in Oncology*, *11*(692592), 492-499.
45. Tahir, A., Wajid, B., Anwar, F., Awan, F. G., Rashid, U., Afzal, F., ... & Wajid, I. (2023, March). Survivability period prediction in colon cancer patients using machine learning. In *2023 International Conference on Energy, Power, Environment, Control, and Computing (ICEPECC)* (pp. 1-4). IEEE.
46. Iqbal, H., Khan, S., Tahir, A., & Ramzan, H. (2024, November). Convolutional Neural Network Driven Electroencephalogram Characterization for Robust and Efficient Schizophrenia Diagnosis. In *2024 3rd International Conference on Emerging Trends in Electrical, Control, and Telecommunication Engineering (ETECTE)* (pp. 1-5). IEEE.
47. Afzal, F., Wajid, B., Anwar, F., Rashid, U., Awan, F. G., Tahir, A., ... & Anwar, A. R. Praedico–Salvos: an ensemble ML framework for predicting survivability of thyroid cancer patients.
48. Buk Cardoso, L., Cunha Parro, V., Verzinhasse Peres, S., Curado, M. P., Fernandes, G. A., Wünsch Filho, V., & Natasha Toporcov, T. (2023). Machine learning for predicting survival of colorectal cancer patients. *Scientific reports*, *13*(1), 8874.
49. Gupta, P., Chiang, S. F., Sahoo, P. K., Mohapatra, S. K., You, J. F., Onthoni, D. D., ... & Tsai, W. S. (2019). Prediction of colon cancer stages and survival period with machine learning approach. *Cancers*, *11*(12), 2007.
50. Gondal, M. N., Butt, R. N., Shah, O. S., Nasir, Z., Hussain, R., Khawar, H., ... & Chaudhary, S. U. (2020). In silico Drosophila Patient Model Reveals Optimal Combinatorial Therapies for Colorectal Cancer. *bioRxiv*, 2020-08.