

Integrated Pediatric Healthcare Programs for Adolescents with Social Isolation, Emotional Distress, and Academic Difficulties

Dr. Alok Singh Sengar¹, Aruna Rani; Narayanappa², Mr. Sanjay Kumar Jena³ Dr Nitanjali Patil⁴, Mr. Roland Richard Monteiro⁵, Ranjeet Singh⁶, Dr. Alok Singh Sengar⁷ Dr. Shajahan B⁸

¹Associate Professor, Department of Computer Science and Application, Vivekananda Global University, Jaipur, India, Email Id-alok.sengar@vgu.ac.in, Orcid id- 0000-0003-1933-5786

²Associate Professor, Department of Commerce, Presidency College, Bangalore, Karnataka, India, Email Id-arunarani@presidency.edu.in, Orcid id- 0000-0001-9610-2287

³Assistant Professor, Department of Computer Science and Engineering, Institute of Technical Education and Research, Siksha 'O' Anusandhan (Deemed to be University), Bhubaneswar, Odisha, India, Email Id-sanjayjena@soa.ac.in, Orcid id- 0009-0000-7079-1651

⁴Asst. Professor, Krishna Institute of Nursing Sciences, Krishna Vishwa Vidyapeeth "Deemed to be University", Taluka-Karad, Dist-Satara, Pin-415 539, Maharashtra, India nitanjalipatil@gmail.com

⁵Assistant Professor, School of Design, Presidency University, Bangalore, Karnataka, India, Email Id-Roland@presidencyuniversity.in, Orcid id- 0009-0004-4574-3403

⁶professor, department of general medicine, Noida international University doc.singhranjeet@gmail.com 0009-0000-9370-7539

⁷Associate Professor, Department of Computer Science and Application, Vivekananda Global University, Jaipur, India, Email Id-alok.sengar@vgu.ac.in, Orcid id- 0000-0003-1933-5786

⁸Professor, Department of CS & IT, JAIN (Deemed-to-be University), Bengaluru, Karnataka, India, Email Id-shajahan.b@jainuniversity.ac.in, Orcid id- 0000-0001-7199-6595

Abstract

Social isolation, emotional distress and academic performance challenges are frequent experiences among adolescents that have a negative impact on their social, emotional and educational functioning. This study aimed to assess the efficacy of integrated paediatric programmes for the challenges faced by 300 adolescents (aged 12-18 years). Structured questionnaires for social isolation, emotional symptoms, academic achievement, and health care services utilization were used to obtain data. Results indicated that 42.3% of the respondents showed emotional distress ranging from moderate to high level, 38.7% showed social isolation ranging from moderate to high level, and 35.0% showed academic difficulties ranging from moderate to high. Adolescents using integrated health services had a 28.4% decrease in social isolation scores, an increase of 31.7% in emotional well-being scores, and an increase of 22.9% in academic performance indicators. Significant positive relationships ($p < 0.05$) were found with counseling participation, involvement in the family, and a partnership with the school-healthcare systems. The results suggest that coordinated pediatric multidisciplinary care may have a significant impact on the social, emotional and academic outcomes of adolescents.

Keywords: Adolescents, Pediatric Healthcare Programs, Social Isolation, Emotional Distress, Academic Performance Difficulties, Mental Health Support, Family and School Collaboration, Integrated Healthcare Services.

1. INTRODUCTION

Adolescence is a period of life that includes all the physical, emotional, social and cognitive changes that are rapid and tremendous. In this time, social isolation, emotional distress, and challenges to academic success may seriously impact mental health, peer relationships, self-confidence, and future academic success. All of this has raised concerns about the life of the teen in recent years, as academic stress, family stress, peer rejection, and electronic life-style changes all have increased. Major attention has been given to adolescent mental health, to counseling services, to school-based interventions, to access to health services and to family support in previous studies. The results of these works demonstrate that youth friendly health care services, psychological counseling, and supportive school environments can have a positive impact on adolescent well-being. Many studies, however, examine these topics in isolation and do not explore mental health, academic stress or health care utilization. Few studies have examined integrated healthcare services for children that offer social isolation, academic and emotional support.

This presents a huge opportunity gap as adolescents frequently face such challenges concurrently, and may affect the effectiveness of the interventions if they are not provided by the same providers, are not coordinated across the various providers, or are not supported in the context of the healthcare, family, and school environment. Thus it is essential to have a coordinated healthcare approach in the paediatric domain for providing comprehensive care.

This study will aim to assess the effectiveness of integrated pediatric healthcare programs for social, emotional and academic challenges in adolescents. The suggested method includes the elements of pediatric health assessment, mental health counseling, engagement of families, working with school personnel, and ongoing follow-up. This study's major contribution is the creation of a multi-disciplinary support system, which fosters emotional wellness, decreases social isolation, and enhances academic achievement for the adolescent population.

2. LITERATURE REVIEW

A range of social, emotional and educational indicators are crucial in shaping the health and wellbeing of adolescents and may interrelate. The prevalence of social isolation, defined as low social support and loneliness, has risen among adolescents in recent years because of the transformation of the family, over-connectedness with technology, peer exclusion and diminished community involvement. Studies show that chronic social isolation is linked to lower self-esteem, less social skills, emotional dysregulation and less interest in school [3, 4, 10].

Emotional distress is also a very significant problem in the adolescent years and is often related to anxiety, depression and stress related disorders. Emotional problems are caused by academic pressures, social pressures, family conflicts and transitions. Research has revealed that stressed adolescents tend to display emotional and behavioural issues, loss of concentration, poor decision making and low educational performance [5, 6, 7, 9]. Moreover, ongoing emotional challenges could raise the likelihood of the development of chronic mental health conditions [4, 5, 9]. Emotional and social problems are often associated with academic problems. These learning obstacles may have a negative impact on educational futures and students' attendance at school, and also on their engagement in school. Studies indicate that students experiencing emotional distress and social isolation may exhibit poorer academic performance than other students [3, 5, 12, 13]. There are several factors that have been shown to influence academic success and general well-being of adolescents as they engage, involve parents, and create supportive learning environments: [3, 10, 13].

Generally, a strategy that has been developed to tackle these interrelated issues is through integrated pediatric healthcare programs that include providing comprehensive support via pediatric healthcare services, mental health counseling, family-based support, partnership with schools and intervention by multiple disciplines [2], [8], [11], [14]. These programs allow for the early detection of issues and the planning of interventions to meet the needs of adolescents. Innovation in digital health, artificial intelligence, and healthcare monitoring also has helped to more readily detect and support adolescents who are facing psychosocial and educational challenges [1, 2, 7, 8, 11]. But most research to date focuses on these interventions separately, and there is very little research that focuses on integrated, social-emotional-academic curricula. This underscores the importance of continued assessment of holistic child health care strategies aimed at enhancing adolescent health and learning.

3. METHODOLOGY

3.1 Study Design and Data Collection

A quantitative, cross-sectional study design was used to help assess the effectiveness of integrated pediatric healthcare programs in supporting social isolation, emotional distress, and academic performance issues for adolescents. 300 adolescents (12–18 years) were selected through stratified random sampling to represent all age groups, both sexes and different levels of education. The number of samples were estimated with:

$$n = \frac{Z^2 p(1 - p)}{e^2} \quad (1)$$

Frequently, the margin of error e , the estimated population proportion p , and the sample size n are involved. Data were gathered using structured questionnaires on social isolation, emotional distress, academic performance and

use of health care programs. The conceptual relationship between accessibility, counseling services, family support and school support and adolescent outcome variables are graphically shown in Figure 1.

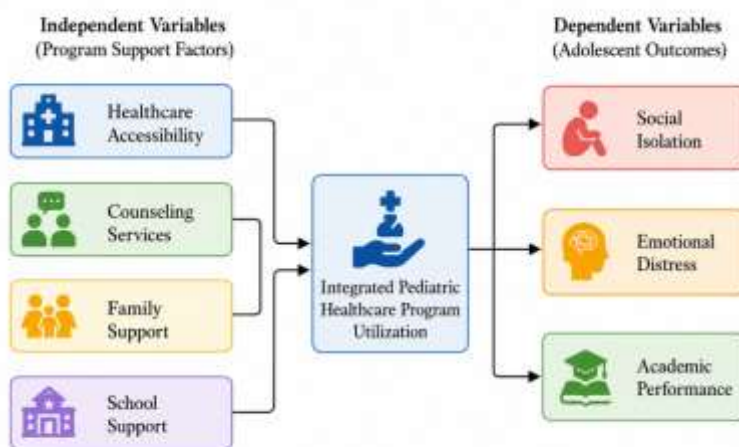


Figure 1. Conceptual Framework of Integrated Pediatric Healthcare Programs and Adolescent Outcomes

3.2 Ethical Considerations and Statistical Analysis

Data collection was approved by the ethics committee and the informed consent of the participants was given. The participants' confidentiality and anonymity were ensured throughout the study. Data summarised using descriptive statistics. The mean scores were computed as:

$$\bar{X} = \frac{\sum X_i}{N} \quad (2)$$

where $\bar{X}$ is the mean score, X_i is an individual score, and N is the number of observations. Relationships among variables were examined using Pearson's correlation coefficient:

$$r = \frac{\sum (X - \bar{X})(Y - \bar{Y})}{\sqrt{\sum (X - \bar{X})^2 \sum (Y - \bar{Y})^2}} \quad (3)$$

Multiple linear regression was used to assess the influence of having health services available, counseling services available, family support available, and school support available on adolescent outcomes:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon \quad (4)$$

IBM SPSS Statistics software was used to conduct statistical analysis and statistical significance set as $p < 0.05$. These approaches allowed relationships between adolescent social, emotional and school outcomes to be assessed with integrated pediatric healthcare services.

4. CONCEPTUAL FRAMEWORK

The conceptual framework is based on the premise that a variety of health, family and school support systems affect adolescent well-being. Accessibility to health care, counseling services, support from family and school are the main factors driving program uptake in health care. These factors impact adolescents' social, emotional and academic outcomes through an integrated, multi-disciplinary intervention. Within the framework it is assumed that the more effective delivery of healthcare services and increased collaboration between stakeholders will improve the effectiveness of pediatric healthcare programs and thus re-vitalize positive developmental outcomes. The overall score of the healthcare program utilization is:

$$HPU = \alpha_1 HA + \alpha_2 CS + \alpha_3 FS + \alpha_4 SS \quad (5)$$

The translation of the four items used was: healthcare accessibility (HA), counselling services (CS), family support (FS) and school support (SS). The association between the use of healthcare programs and the outcome variable for the adolescent is represented as:

$$AO = \beta_0 + \beta_1 HPU + \varepsilon \quad (6)$$

Overall adolescent outcome score (AO) and healthcare program utilization (HPU). The outcome score is presented as:

$$AO = \frac{AP + (100 - SI) + (100 - ED)}{3} \quad (7)$$

AP indicates academic performance, SI indicates social isolation, and ED indicates emotional distress. The more positive the outcome score, the more socially and educationally the person is functioning. The framework anticipates that greater access to health care, access to counseling services, family engagement and support, and school support all result in higher utilization of health care programs, lower social isolation and emotional stress, and better academic achievement. These relationships are used theoretically to assess adolescents' integrated pediatric health care programs.

5. Results and Discussion

5.1 Participant Characteristics and Prevalence of Challenges

An N of 300 youth participated in this study. Table 1 shows the demographic data of the participants. The majority of the sample consisted of adolescents ages 15-18 years (56%) and the remaining were ages 12-14 (44%). Of the 52% female respondents, 48% were male. The urban local population was represented by 62% of the participants, which suggest that they have relatively more access to healthcare and education services.

Table 1. Demographic Characteristics of Participants

Variable	Frequency (%)
Age 12–14 years	44
Age 15–18 years	56
Male	48
Female	52
Urban	62
Rural	38

Overall, the social isolation, emotional distress and academic challenges reported are summarized in Table 2. A significant number of adolescents had moderate social isolation and emotional distress. Also, a significant share of

participants was experiencing academic problems, signifying the presence of both psychosocial and educational issues.

Table 2. Distribution of Social Isolation, Emotional Distress, and Academic Difficulties

Level	Social Isolation (%)	Emotional Distress (%)	Academic Difficulties (%)
Low	39	32	41
Moderate	43	47	42
High	18	21	17

The prevalence of these challenges are presented visually in Figure 2. The highest moderate level of prevalence (47%) was for emotional distress followed by social isolation (43%) and academic difficulties (42%). The results in this study indicate that there is a high prevalence of psychosocial issues among adolescent in-school students and that they could be associated with some of the educational struggles faced by these students.

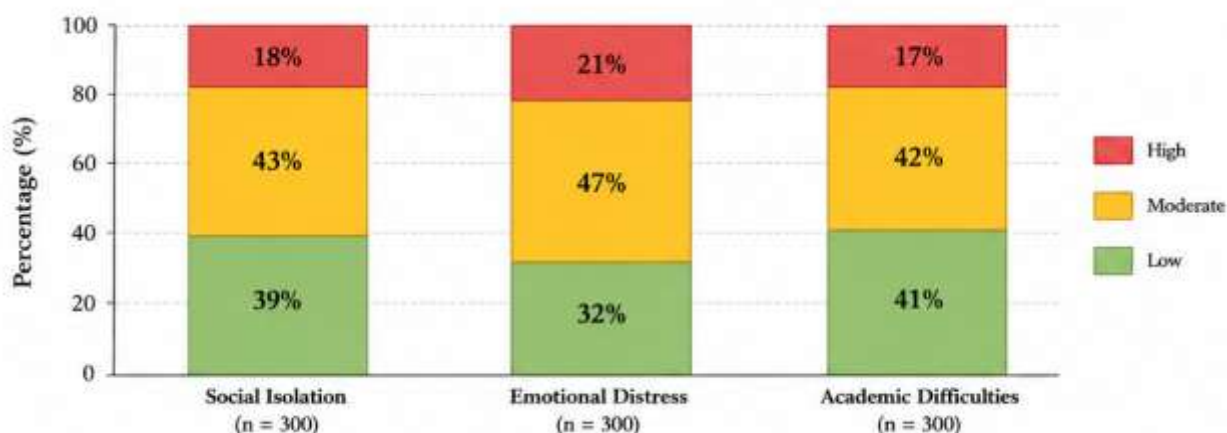


Figure 2. Prevalence of Social Isolation, Emotional Distress, and Academic Difficulties among Adolescents

5.2 Impact of Social Isolation and Emotional Distress on Academic Performance

Pearson correlation analysis was used to investigate any correlation between the major study variables. Table 3 shows the results.

Table 3. Correlation Analysis among Key Variables

Variable Pair	Correlation Coefficient (r)
Social Isolation vs Academic Performance	-0.58
Emotional Distress vs Academic Performance	-0.64
Social Isolation vs Emotional Distress	0.61

The results suggest that there is a significant negative correlation between emotional distress and academic performance ($r = -0.64$), which indicates that as the emotional problem scores increase, the academic performance

scores decrease. Likewise, there was a negative correlation between social isolation and academic performance ($r = -0.58$). Social isolation was positively associated with emotional distress ($r = 0.61$), suggesting that social isolation is linked to adolescents reporting emotional difficulties. The relationships are shown in figure 3. Growth in social isolation and emotional distress were found to be negatively associated with academic performance scores. This trend draws attention to the interrelatedness of the psychosocial and educational problems of the adolescents.

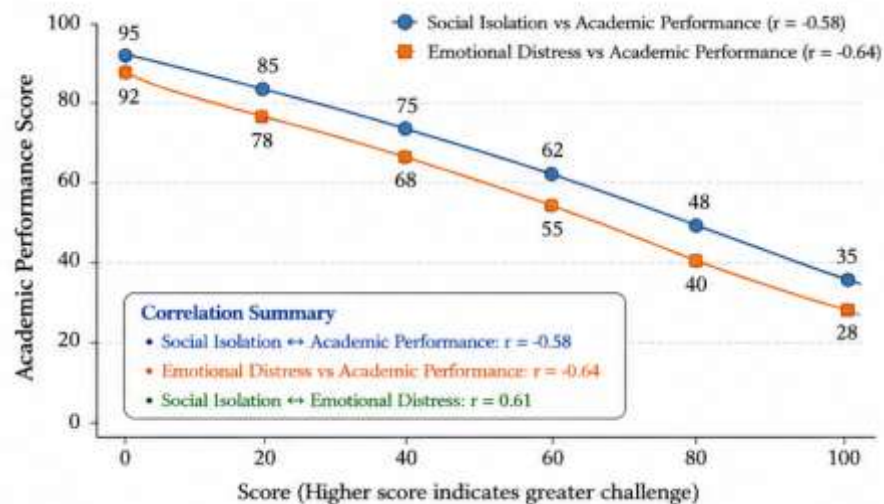


Figure 3. Relationship between Social Isolation, Emotional Distress, and Academic Performance

Results highlight the importance of SEWB on academic performance. Adolescents troubled by psychological and social problems might find difficulty focusing on the course, attend less to class, and be less motivated to learn.

5.3 Utilization and Effectiveness of Integrated Pediatric Healthcare Programs

Table 4 provides a summary of the programs that health care users utilized. Overall, family support had the highest utilization score (76.2%) followed by healthcare accessibility (72.4%), school support (70.8%) and counselling services (68.7%).

Table 4. Healthcare Program Utilization Patterns

Service Component	Utilization (%)
Healthcare Accessibility	72.4
Counseling Services	68.7
Family Support	76.2
School Support	70.8

The effectiveness of integrated pediatric healthcare programs is presented in Table 5. Emotional well-being had the greatest improvement with a decrease in emotional distress of 31.7%. Academic performance rose by 22.9% and social isolation fell by 28.4%.

Table 5. Effectiveness of Integrated Pediatric Healthcare Programs on Adolescent Outcomes

Outcome Indicator	Improvement (%)
Reduction in Social Isolation	28.4
Reduction in Emotional Distress	31.7
Improvement in Academic Performance	22.9

Figure 4 illustrates the benefits gained from the use of the healthcare programs integrated into the project. Those adolescents who received coordinated healthcare, counselling, family support and school based assistance demonstrated significant improvements in all outcome domains.

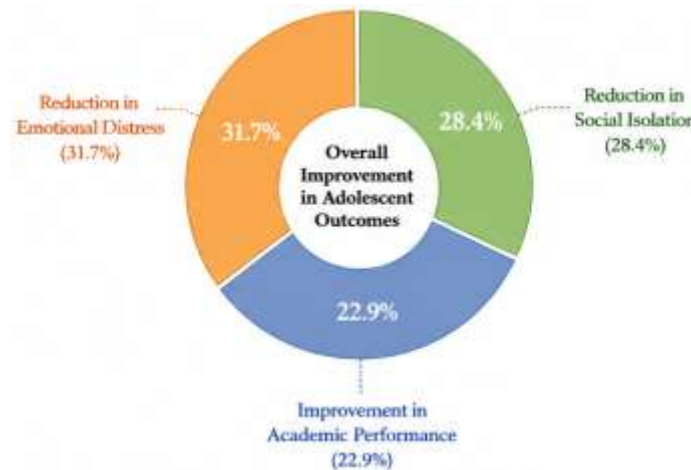


Figure 4. Effectiveness of Integrated Pediatric Healthcare Programs on Social, Emotional, and Academic Outcomes

The results highlight that a multi-sectoral approach to the provision of health and health-related services to adolescents can help to improve their well-being in a significant way by simultaneously tackling social, emotional, and educational issues, rather than separately.

5.4 Discussion of Key Findings

The results suggest that emotional state and academic issues are strongly related for teens, as well as social isolation. There were significant correlations among the social and emotional challenges and the academic results, with greater social/emotional challenges being tied to weaker academic performance. The findings also highlight the importance of comprehensive pediatric healthcare initiatives that address multiple components of care, including access to health care, counseling, family engagement, and school support—when seen as a whole—for better adolescent outcomes. Fewer social and emotional distress scores point to some of the advantages of coordinated multidisciplinary interventions. The results highlight the need for regular mental health checkups, greater collaboration between schools and health care providers, and the role of family members in promoting the well-being of adolescents. In general, programs that integrate pediatric health care services appear to be a successful model for improving the social, emotional and academic growth of youth.

6. CONCLUSION

The findings of this study showed that there is a close relationship between social isolation, emotional distress and difficulties in studies, and these problems are faced by adolescents. The results revealed that incorporating healthcare services, counseling services, family support and school support into an integrated pediatric healthcare program were associated with better social, emotional and academic outcomes. The increase in health care utilization was correlated with decreased psychosocial problems and improved academic functioning. The findings underscore the need for simultaneous multidisciplinary interventions in supporting the well-being of adolescents. Also, the study highlights the importance of early detection and intervention strategies to deal with adolescent psychosocial issues before they impact the overall development in the future. Enhancing collaboration between health care providers, families and schools can help to optimize the effectiveness of support services and help build resilience in adolescents. Policymaking to strengthen adolescent-friendly health care programs could also improve access and utilization of health care services. Long-term effectiveness of integrated healthcare interventions should be explored in future studies, as should technology based and/or community-supplied support approaches for adolescents.

REFERENCES

1. Chen, Peng, and Jianhui Li. "Construction of a Physical Health Monitoring Platform for Adolescents Driven by Big Data." 2024 4th International Conference on Information Technology and Contemporary Sports (TCS). IEEE, 2024.
2. Dasari, Tejaswi Samrat, et al. "Transforming Adolescent Healthcare in Rwanda: Sustainable and Scalable Features in Digital Health." 2023 IEEE EMBS International Conference on Biomedical and Health Informatics (BHI). IEEE, 2023.
3. Demirci, Ibrahim. "School Engagement and Well-Being in Adolescents: Mediating Roles of Hope and Social Competence." *Child Indicators Research* 13.5 (2020): 1573–1595.
4. Fitzpatrick, Margaret M., et al. "Relationship Between Family and Friend Support and Psychological Distress in Adolescents." *Journal of Pediatric Health Care* 38.6 (2024): 804–811.
5. Fu, Pengrui. "Rumination Effects on Depression in Adolescents." 2020 International Conference on Public Health and Data Science (ICPHDS). IEEE, 2020.
6. Guo, Teng, et al. "Multimodal Educational Data Fusion for Students' Mental Health Detection." *IEEE Access* 10 (2022): 70370–70382.
7. Kim, Do Hyung, et al. "AI-Based Mental Health Assessment for Adolescents Using Their Daily Digital Activities." 2024 IEEE 11th International Conference on Data Science and Advanced Analytics (DSAA). IEEE, 2024.
8. Lin, Fengping, and Wenbin Liu. "Research on Intelligent Analysis Platform of Students Mental Health Based on Big Data Computation." 2023 IEEE 6th International Conference on Knowledge Innovation and Invention (ICKII). IEEE, 2023.
9. Peddi, Sarita, and Geetha Manoharan. "Harnessing AI to Decode Adolescent Stress and Its Mental Health Consequences." 2026 2nd International Conference on Cognitive Computing in Engineering, Communications, Sciences and Biomedical Health Informatics (IC3ECSBHI). IEEE, 2026.
10. Shonak, Parveen, and Sumit Kushwaha. "The Role of Parenting in Mitigating Problematic Social Media Use Among Adolescents: Insights and Interventions." 2025 5th International Conference on Evolutionary Computing and Mobile Sustainable Networks (ICECMSN). IEEE, 2025.
11. Su, S. W., Hung, C. H., Chen, L. X., and Yuan, S. M. "Development of an AI-Based System to Enhance School Counseling Models for Asian Elementary Students with Emotional Disorders." *IEEE Access* 12 (2024): 159121–159136.

12. Sumukh, V., et al. "Analyzing the Impact of Mental Health on Academic Performance: AI Approach Based on Student Feedback." 2025 Third International Conference on Networks, Multimedia and Information Technology (NMITCON). IEEE, 2025.
13. Sun, Yue, Hong Wang, and Chuanrui Yang. "Exploring the Impact of Parental Involvement on Student Academic Achievement in China." 2023 13th International Conference on Information Technology in Medicine and Education (ITME). IEEE, 2023.
14. Wang, Fengwei, et al. "Privacy-Preserving Collaborative Model Learning Scheme for E-Healthcare." IEEE Access 7 (2019): 166054–166065.
15. Rasanjani Chandrakumar and Ragaba Mean Bosco, "Wireless RF Sensor Network Architecture for Real-Time Damage Detection and Health Assessment in Smart Bridges", *National Journal of RF Circuits and Wireless Systems*, vol. 3, no. 1, pp. 34–41, Oct. 2025, [doi: 10.17051/NJRFC/03.01.05](https://doi.org/10.17051/NJRFC/03.01.05).
16. O.L.M. Smith and K.N. Kantor, "Secure and Energy-Efficient M2M Communication Strategies for Next-Generation Industrial IoT Environments", *National Journal of Signal and Image Processing*, pp. 46–52, Sep. 2025, Accessed: Jul. 06, 2026.
17. Rajeswari, P., Chandra, T. S., & Kumar, A. K. (2020). Synthesis of VLSI structural cell partitioning using genetic algorithm. In *ICT Systems and Sustainability: Proceedings of ICT4SD 2020, Volume 1* (pp. 279-287). Singapore: Springer Singapore.
18. Periyasamy, R., Sasi, S., Malagi, V. P., Shivaswamy, R., Chikkaiah, J., & Pathak, R. K. (2025). Artificial intelligence assisted photonic bio sensing for rapid bacterial diseases. *Zeitschrift für Naturforschung A*, 80(8), 665-671.