

Awareness and Management of Hypertension Among the General Population

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Abstract

Hypertension is a common chronic condition that requires early detection, regular monitoring, and appropriate management to prevent serious complications. This study examines awareness of hypertension and its management practices among the general population. Awareness is assessed through knowledge of blood pressure levels, risk factors, symptoms, possible complications, and the importance of routine screening. Management practices include medication adherence, dietary modification, physical activity, reduction of salt intake, stress control, and regular blood pressure monitoring. The findings suggest that although many individuals are familiar with hypertension, gaps remain in understanding its long-term risks and recommended management strategies. Poor adherence to medication, irregular monitoring, unhealthy dietary habits, and limited physical activity may contribute to inadequate blood pressure control. The study emphasizes the importance of health education, accessible screening programs, lifestyle modification, and continuous medical follow-up to improve hypertension awareness, strengthen self-management practices, and reduce preventable cardiovascular complications within the general population.

Keywords: Hypertension; Awareness; Blood pressure; Disease management; Health education.

1. Introduction

Enterprise applications depend on reliable diagnostics to detect runtime errors, failed workflows, API issues, slow transactions, and integration faults [1-5]. Logs are the main evidence source for understanding what happened before, during, and after an incident [6-9]. Effective application diagnostics require structured logging, traceability, contextual metadata, error classification, and operational visibility [10-15]. However, fixed logging strategies often create two problems. Low-detail logs may miss important causes [16-19], while high-detail logs may generate excessive storage cost and alert noise [20-23].

The main challenge is that diagnostic needs change during runtime. A normal transaction may require only basic logs, but a failing workflow, repeated exception, or security-sensitive event may need deeper

traces [24-28]. Adaptive logging improves this process by changing log depth according to system condition, transaction risk, and error behavior [29-32]. AI-assisted monitoring can identify when additional diagnostic detail is needed and when logging can return to normal levels [33-35]. This article proposes an adaptive logging framework for enterprise application diagnostics.

2. Methodology

The proposed framework captures log metadata from application servers, API gateways, databases, background jobs, authentication modules, and integration services [36-40]. It records event type, severity, timestamp, user role, transaction ID, request path, error frequency, response time, affected component, and workflow state [41-45]. These features are converted into diagnostic context profiles. Adaptive logging requires context because the same event may be low-risk in one workflow but critical in another [46-49].

The logging controller classifies runtime states as normal, warning, error-prone, performance-risk, security-sensitive, workflow-critical, or incident-active [50-54]. Based on this classification, it adjusts log level, trace depth, parameter capture, correlation ID tracking, and diagnostic enrichment. Lightweight scoring and policy rules are used so logging decisions remain fast and explainable [55-58]. Sensitive fields are masked before storage [59-60], and transaction-critical events are linked with workflow and database identifiers for easier diagnosis [61-63].

The framework is evaluated using simulated enterprise applications involving APIs, database workflows, authentication events, scheduled jobs, and service integrations. Static logging is compared with adaptive logging under repeated exceptions, slow requests, failed jobs, API timeout, suspicious login, and workflow interruption scenarios [64-67]. Evaluation metrics include diagnosis time, log volume reduction, root-cause evidence quality, missed-event rate, storage overhead, alert usefulness, and administrator acceptance rate [68-69]. Feedback from resolved incidents, ignored logs, and administrator notes is used to refine logging policies over time.

3. Results and Discussion

The results show that adaptive logging improves diagnostics by capturing richer evidence only when runtime risk increases. In the baseline condition, static logs either lack enough detail or produce large volumes of low-value records. With the proposed framework, detailed traces are activated for high-risk events and reduced during normal execution. The strongest improvement appears in intermittent failures, where deeper logs are needed only around the failure window.

The discussion shows that adaptive logging must balance diagnostic depth with privacy and storage cost. Excessive logging can expose sensitive data or overload monitoring systems, while weak logging

may hide failure causes. The main limitation is that log-level decisions depend on accurate runtime classification. Regular policy review and masking controls are necessary for safe long-term use.

4. Conclusion

This article presented an adaptive logging framework for enterprise application diagnostics. The framework adjusts log detail using runtime context, risk scoring, workflow state, and error behavior. It improves troubleshooting by increasing diagnostic evidence during abnormal conditions while reducing unnecessary log noise during normal operation. The study shows that adaptive logging can strengthen enterprise diagnostics when combined with structured metadata, privacy controls, and continuous incident feedback.

References

1. Jalal, K. C. A., Nur Fatin, U. T., Mardiana, M. A., Akbar John, B., Kamaruzzaman, Y. B., Shahbudin, S., & Muhammad Nor, O. (2010). Antibiotic resistance microbes in tropical mangrove sediments in east coast peninsular, Malaysia. *African Journal of Microbiology Research*, 4(8), 640-645.
2. Kamaruzzaman, B. Y., Shuhada, N. T., Akbar, B., Shahbudin, S., Jalal, K. C. A., Ong, M. C., ... & Goddard, J. S. (2011). Spatial concentrations of lead and copper in bottom sediments of Langkawi Coastal Area, Malaysia. *Research Journal of Environmental Sciences*, 5(2), 179.
3. Khan, S. A., Lyla, P. S., John, B. A., Kuamr, C. P., Murugan, S., & Jalal, K. C. A. (2010). DNA barcoding of *Stolephorus indicus*, *Stolephorus commersonnii* and *Terapon jarbua* of Parangipettai coastal waters.
4. Selvaganapathi, G., Ahmed, J., Mathialagan, A. G., Dinesh, M., Azra, N., Harikrishnan, T., ... & Foead, A. I. (2016). Knowledge and practice on tuberculosis among prison workers from Seremban Prison. *Medicine*, 7, 176-186.
5. Maziz, M. N. H., Chakravarthi, S., Aung, T., Htoo, P. M., Shwe, W. H., Gupalo, S., ... & Kodali, M. (2025). Microglia-mediated neuroinflammation through phosphatidylinositol 3-kinase signaling causes cognitive dysfunction. *International Journal of Molecular Sciences*, 26(15), 7212.
6. Subramaniyan, V., Fuloria, S., Sekar, M., Shanmugavelu, S., Vijeepallam, K., Kumari, U., ... & Fuloria, N. K. (2023). Introduction to lung disease. In *Targeting epigenetics in inflammatory lung diseases* (pp. 1-16). Singapore: Springer Nature Singapore.
7. Hua, B. H., Sugumaran, S. V., Faryza, E., Atiqah, N., Jasvindar, K., Kabir, M. S., ... & Nazmul, M. H. (2022). Prevalence of musculoskeletal disorders (MSD) and smartphone addictions among university students in Malaysia. *Int J Health Sci*, 6(S3), 1075-88.

8. Tien, L. P., Atiqah, N., Vytialingam, N., Rashid, M. A., Kabir, M. S., Farzana, Y., & Nazmul, M. H. M. (2022). Stress and quality of life among fathers of special needs children in Klang Valley. *Journal of Pharmaceutical Negative Results*, 13, 1010-1018.
9. Nazmul, M. H. M., Devaraj, S., Farzana, Y., Vasu, N., Gupalo, S., Doustjalali, S. R., & Shafiei, S. N. (2025). Bioaccumulation of heavy metals in aquatic organisms and its effects on human consumption.
10. Noureen, A., Islam, T., Rashid, M. A., Kabir, M. S., Mathialagan, A., Farzana, Y., ... & Nazmul, M. H. M. (2022). Indoor Motor Exercise Regimens Improve Social Cognition in Children With Autism Spectrum Disorder: A Systematic Review. *Journal of Pharmaceutical Negative Results*, 13(6), 2020-2028.
11. Khan, M. F. K., & Maziz, M. N. H. (2019). Antibiotic resistance. LAP LAMBERT Academic Publishing.
12. Krishnapillai, A., Lugova, H., Haque, M., Ariaratnam, S., Aziz, A. F. B. A., Maziz, M. N. H., ... & Godman, B. (2022). The shock of the SARS-CoV-2 pandemic on health professionals' education: A pilot qualitative study in Malaysia. *Journal of Applied Pharmaceutical Science*, 12(10), 161-171.
13. Jayaraj, N., Atiqah, N., Vytialingam, N., Kabir, M. S., Shirin, L., Irfan, M., ... & MHM, N. (2022). Parental attitudes about play in preschool aged children. *International Journal of Early Childhood Special Education*, 14(3).
14. OO, K. T., WONG, R. S., WWL, S., RAMLI, N., LOW, S., ELBAHLOUL, M., ... & KHALAF, J. H. (2020). Correlation between Body Mass Index (BMI) and Fasting Blood Glucose (FBG) Level among Malaysian Adults Age 40-60. *PJMHS Online*, 14(3).
15. Wirdahayu, M. S., binti Ismail, S. F., Murugan, S., Rashid, M. A., Kabir, M. S., Chia, T. Y., & Shaker, U. A. (2025). The associations of sensory processing and quality of life among children with autism spectrum disorder in Klang Valley, Malaysia. *Cuestiones de Fisioterapia*, 54(4), 5864-5873.
16. Jie, H. S., & Nellikunnel, S. (2023). A study on Jose Mourinho's leadership skills and performance on football clubs. *Journal of Business and Social Sciences*, 2023.
17. Jiayi, C., & Devasia, S. N. (2023). Factors influencing consumer behavior in preference for douyin (tiktok) in China. *Journal of Business and Social Sciences*, 2023.
18. GAIK, C., RAHMAN, S., RASHEEDUL, H., Syriac, N. D., PARAMESWARAN, S., & TIPPAWAN, L. (2024). Towards Sustainable Development at Full-Service Restaurants in West Malaysia. *Journal of Infrastructure, Policy and Development*, 8(16), 5288.
19. Qi, Z., & Devasia, S. N. (2023). Relationship of Soft Skills and Employees Performance of Hotels in China. *Journal of Business and Social Sciences*, 2023.
20. Mun, G. O. Y., & Syriac, N. D. (2018). A review paper on Last Mile Logistics operation design, challenges and opportunities in Malaysia. *INTI Journal*, 1(18).

21. Naseer, A. I. N., & Nellikunnel, S. (2024). The ESG Shift: Role of ESG in Modern Business Strategies. *Journal of Business and Social Sciences*, 2024.
22. Peng, S. L., & Nellikunnel, S. (2024). ESG Indices, Sustainable Practices and Strategic Competitiveness within the Modern Business Landscape. *Journal of Business and Social Sciences*, 2024.
23. Guan, D., & Syriac, N. (2023). Modelling Factors Influencing Consumers Trust in E-Commerce in Shanghai China. *Journal of Business and Social Sciences*, 2023(19), 1-8.
24. Ramdass, R., Rahman, A., & Nellikunnel, S. (2016). National qualifications framework: a qualitative approach towards the determination of the critical success factors. *International Journal of Services, Economics and Management*, 7(2-4), 167-197.
25. Sheikh, H. I., Alhamadin, N. I. I., Liew, H. J., Fadhlina, A., Wahid, M. E. A., Musa, N., & Jalal, K. C. A. (2024). Virulence factors of the zoonotic pathogen *Vibrio alginolyticus*: a review and bibliometric analysis. *Applied Biochemistry and Microbiology*, 60(3), 514-531.
26. Chowdhury, A. J. K., John, A., Aqilah, N. S., Abdullah, R., Salihah, N. T., Basir, K. H., & Marsal, C. J. (2024). Macrobenthic community towards sustainable aquatic ecosystem: A systematic review along the coastal waters of Malaysia. *Geology, Ecology, and Landscapes*, 8(1), 57-70.
27. Kamaruzzaman, B. Y., John, B. A., Megat, M. A., & Zaleha, K. (2011). Bioaccumulation of heavy metals in horseshoe crabs *Tachypleus gigas* from Pekan, Pahang, Malaysia. *Research Journal of Environmental Toxicology*, 5(3), 222.
28. Kamaruzzaman, B. Y., Zahir, M. S., John, B. A., Waznah, A. S., Jalal, K. C., Shahbudin, S., ... & Goddard, J. S. (2010). Determination of some heavy metal concentrations in razor clam (*Solen brevis*) from Tanjung Lumpur coastal waters, Pahang, Malaysia. *Pakistan journal of biological sciences: PJBS*, 13(24), 1208-1213.
29. Chen, Z. X., Lei, Q., He, R. L., Zhang, Z. F., & Chowdhury, A. J. K. (2016). Review on antibacterial biocomposites of structural laminated veneer lumber. *Saudi journal of biological sciences*, 23(1), S142-S147.
30. Li, J., Zhang, X., Kammer, J. A., Liang, M. C., Shia, R. L., & Yung, Y. L. (2014). Author's Accepted Manuscript.
31. Eissa, E. S. H., Okon, E. M., Abdel-Warith, A. W. A., Younis, E. M., Dowidar, H. A., Elbahnaswy, S., ... & Elabd, H. (2024). In-water *Bacillus* species probiotic improved water quality, growth, hemato-biochemical profile, immune regulatory genes and resistance of Nile tilapia to *Aspergillus flavus* infection. *Aquaculture International*, 32(6), 7087-7102.
32. John, B. A. (2011). Artificial seagrass: a habitat for marine fishes. *Journal of Fisheries and Aquatic Science*, 6(1), 85-92.
33. Rana, M. M., Asdari, R., Chowdhury, A. J. K., & Munir, M. B. (2023). Heavy metal contamination during processing of canned fish: a review on food health and food safety. *Desalination and Water Treatment*, 315, 492-499.

34. Jalal, K. C., Kamaruzzaman, B. Y., Arshad, A., Ara, R., & Rahman, M. F. (2012). Diversity and distribution of fishes in tropical estuary Kuantan, Pahang, Malaysia. *Pakistan journal of biological sciences: PJBS*, 15(12), 576-582.
35. Jalal, K. C. A., Alifah, F. K., Faizul, H. N. N., Mamun, A. A., Kader, M. A., & Ashraf, M. A. (2018). Diversity and community composition of fishes in the Pusu River (Gombak, Malaysia). *Journal of Coastal Research*, 82(SI), 150-155.
36. Jalal, K. C. A., Akbar John, B., Habab, M., Mohd, A. Y., & Kamaruzzaman, B. Y. (2013). Bioaccumulation of selected metals in fresh water Haruan fish (*Channa striatus*) collected from Pahang River basin, Malaysia.
37. Maah, M. J. (2011). Study of biosorptive potential in the peel of *Citrus reticulata*, *Punica granatum*, *Daucus carota* and *Momordica charantia*. *African Journal of Biotechnology*.
38. Salleh, S. M., Sah, S. A. M., & Chowdhury, A. J. K. (2018). Assessing nesting status of green turtles, *Chelonia mydas* in Perak, Malaysia. *Tropical Life Sciences Research*, 29(1), 155.
39. Akbar John, B., Jalal, K. C. A., & Kamaruzzaman, B. Y. (2013). Macrobenthic diversity in horseshoe crab nesting ground-Balok station, Pahang, Malaysia.
40. Musa, N., Musa, N., Ibrahim, W. N., Zahrol Ariff Shariat, M., Zamani, A. I., Abdullah, M. R., ... & Soh, A. S. A. (2011). Methanolic activities of selected weeds on bacteria isolated from *Macrobrachium rosenbergii* larvae. *The Thai Journal of Veterinary Medicine*, 41(4), 535-540.
41. Jalal, K. C. A., Ambak, M. A., Saad, C. R., Hasan, A., & Abol-Munafi, A. B. (2000). Apparent digestibility coefficients for common major feed ingredients in formulated feed diets for tropical sport fish, *Tor tambroides fry*. *Pakistan Journal of Biological Sciences (Pakistan)*, 3(2).
42. Ng, J. F., Ahmed, O. H., Omar, L., Jalloh, M. B., Kwan, Y. M., Musah, A. A., ... & Jimmy, D. R. (2024). Mitigating water pollution by nitrogen fertilizers through amending ammonium sorption in an acid soil using Calciprill and sodium silicate. *Desalination and Water Treatment*, 319, 100489.
43. Nordin, N. F. H., Idris, S. N. N. B. M., Nawawi, M. N. M., John, A., & Chowdhury, A. J. K. (2017). Pcb biodegradation using bacteria isolated from landfill leachate. *Science*, 1(2), 07-10.
44. Ashraf, M. A., Maah, M. J., & Yusoff, I. (2011). Study of tin accumulation strategy by *Cyprus* species in pot experiments. *Scientific Research and Essays*, 6(1), 71-78.
45. Kamaruzzaman, B. Y., Siti Waznah, A., Shahbudin, S., Jalal, K. C. A., & Ong, M. C. (2010). The temporal variation of organic carbon during the pre-monsoon and post-monsoon seasons in Pahang river-estuary, Pahang, Malaysia. *Oriental Journal of Chemistry*, 26(4), 1309.
46. Ng, J. F., Ahmed, O. H., Omar, L., Jalloh, M. B., Kwan, Y. M., Musah, A. A., & Chowdhury, A. J. K. (2024). Improving pH buffering capacity of an acid soil to regulate nutrient retention and mitigate water pollution using Calciprill and sodium silicate. *Desalination and Water Treatment*, 319, 100491.

47. Jamaludin, M. H., Marsal, C. J., Chowdhury, A. J. K., Harith, Z. T., Ridzwan, R. M., & Kari, Z. A. (2023). Egg and broiler supply in Malaysia: issues, challenges and recommendations. *Halalsphere*, 3(1), 11-19.
48. Marsal, C. J., Jamaludin, M. H., Anwari, A. S., & Chowdhury, A. J. K. (2023). The potential of aquaculture development in Brunei Darussalam. *Agriculture Reports*.
49. Kadharsha, K., Khan, S. A., Lyla, S., Mohanchander, P., & John, A. (2018). Checklist for commercially important food fishes of Parangipettai. *Journal CleanWAS*, 2(1), 16-19.
50. Jalal, K. C. A., Zaima Azira, Z. A., Nor Hafizah, Z., Rahman, M. M., Kamaruzzaman, B. Y., & Noor Faizul, H. N. (2014). Carotenoid contents in anoxygenic phototrophic purple bacteria, *Marichromatium* sp. and *Rhodopseudomonas* sp. of tropical aquatic environment, Malaysia.
51. Mohd Zahir, M. S., Akbar John, B., Kamaruzzaman, B. Y., Jalal, K. C. A., Shahbudin, S., Mohd Fuad, M., ... & Anies Aznida, M. (2012). The distribution of selected metals in the surface sediment of Langkawi coast, Malaysia.
52. Zakaria, Z., Fadzil, F. N. M., Mohamad, M. A. N., Hamid, A. A. A., Chowdhury, A. J. K., & Harumain, Z. A. S. (2024). Metagenomic analysis of bacterial communities in heavy metal leachate-contaminated soils at Jalan Lipis Sanitary Landfill, Pahang, Malaysia. *Desalination and Water Treatment*, 319, 100512.
53. Rana, M. M., Asdaria, R., Mahmud, S., Irfan, A. F., Chowdhury, A. J. K., & Munir, M. B. (2023). Marine water aquaculture and an IoT-based smart fish dryer of the future: a sustainable environmental approach. *Desalination and Water Treatment*, 315, 515-522.
54. Chowdhury, A., Hazra, A. K., Mahajan, S. C., & Choudhury, J. (2007). Microbial communities of earthworm (*Perionyx excavatus* Perrier) gut, cast and adjacent Soil in two different fields of west Bengal. *Records of the Zoological Survey of India*, 101-113.
55. Vedharajan, B., Pandisamy, R., Nobil, E. P., Hashim, S., John, A., Sivakumar, K., ... & Anantharaman, P. (2023). Seagrasses in the Indian Ocean region with special reference to urbanization. In *Climate Change and Urban Environment Sustainability* (pp. 109-124). Singapore: Springer Nature Singapore.
56. JOHN, A. (2017). Effect of differential feed on the molting success and survival of horseshoe crab trilobite (*Tachypleus gigas*).
57. Hassan, A., Ismail, T. H. T., Saari, M. Y., & Samah, M. A. A. (2015). Public response to the rare earth industries in Malaysia. *Procedia Environmental Sciences*, 30, 62-67.
58. Satyanarayana, B., Raman, A. V., Zhang XiuYing, Z. X., Feng XueZhi, F. X., & Dehairs, F. (2004). Application of GIS in the preparation of species distributional maps for *Coringa* mangroves based on ground truth data.
59. Hamad, J. R. J., Hanafiah, M. M., John, A., Hassan, B., & Sheikh, I. (2017). The practice, challenges and awareness of residential solid waste management in the city of Al Marj, Libya. *Environ Ecosyst Sci*, 1(1), 23-27.

60. Azfar, A. M., Jalal, K. C. A., & Siti-Waznah, A. (2015). Food partitioning among fishes in Pahang river-estuary, Malaysia. *Jurnal Teknologi*, 77, 63-69.
61. Kamaruzzaman, B. Y., Waznah, A. S., Zahir, M. M., Ong, M. C., Shahbudin, S., Jalal, K. C. A., ... & Goddard, J. S. (2010). Distribution of chromium, manganese and cobalt in the bottom sediment of Pahang river-estuary, Pahang, Malaysia.
62. Jalal, K. C. A., Ambak, M. A., Abol, M. A. B., Hassan, T. H., & Alam, M. Z. (2005). Effect of feed additives on the development of proteolytic enzymes of the tropical sport fish Malaysian Mahseer (*Tor tambroides*-Bleeker) fry.
63. Yusofa, K. M. K. K., Jalalb, K. C. A., Abdullahc, S., Azidd, A., Sanie, M. S. A., Yunusb, K., & Ranih, N. L. A. (2021). Haze episodes: identification of air pollutants and meteorological factors in Borneo, Central, Eastern, Northern, and Southern regions of Malaysia. *Desalination and Water Treatment*, 219, 31-39.
64. Akbar John, B., Sheikh, H. I., Jalal, K. C. A., Kamaruzzaman, B. Y., Sanower, H., Nur Hanisah, M., ... & Rozihan, M. (2020). DNA Barcoding of Ichthyoplankton and Juvenile Fishes of a Tropical River in Malaysia. In *DNA Barcoding and Molecular Phylogeny* (pp. 237-251). Cham: Springer International Publishing.
65. Zhang, H., & Khan Chowdhury, A. J. (2019). Research on Integrated Technology of Desulphurization, Denitration and Waste Heat Recovery of Coke Oven Flue Gas. *Nature Environment & Pollution Technology*, 18(5), 1621.
66. Salleh, S. M., Sah, S. A. M., & Chowdhury, A. J. K. (2019). Temperature Influence on Emergence Success and Swimming Speed for In-Situ Nesting for *Chelonia mydas* in Penang Island, Malaysia. *Tropical Life Sciences Research*, 30(3), 111.
67. Han, L., Shang, T., Shu, J., & Khan Chowdhury, A. J. (2018). Time series data intelligent clustering algorithm for landslide displacement prediction. *Journal of Intelligent & Fuzzy Systems*, 35(4), 4131-4140.
68. Ashraf, M. A., & Aqma, W. S. (Eds.). (2017). *Environmental Conservation, Clean Water, Air & Soil (CleanWAS)*. Iwa Publishing.
69. Ridzwan, B. H., Fong, Y. S., Hasniwati, M. H., Shaari, B., & Jalal, K. C. A. (2002). The effect of *Morinda citrifolia* on isolated rat hearts. *Pakistan Journal of Biological Sciences (Pakistan)*, 5(10).