

Nutritional Awareness and Healthy Eating Practices Among Young Adults

Seung-Min Haejin

South Korea

Abstract

Nutritional awareness plays an important role in shaping healthy eating behaviors and supporting long-term health among young adults. This study examines the relationship between nutrition knowledge and healthy eating practices in this population. Nutritional awareness is assessed through understanding of balanced diets, food groups, portion control, nutrient requirements, food labels, and the health effects of excessive sugar, salt, and fat intake. Eating practices are evaluated through meal regularity, fruit and vegetable consumption, fast food intake, snacking behavior, hydration, and food selection. The findings suggest that young adults with greater nutritional awareness are more likely to follow healthier eating patterns and make informed food choices. In contrast, limited nutrition knowledge may be associated with irregular meals, frequent fast food consumption, and poor dietary balance. The study highlights the importance of nutrition education and practical dietary guidance in promoting healthier eating behaviors and improving overall well-being among young adults.

Keywords: Nutritional awareness; Healthy eating; Young adults; Dietary practices; Nutrition 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 [70].

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. Sirajudin, Z. N. M., Ahmed, Q. U., Chowdhury, A. J. K., Kamarudin, E. Z., Khan, A. V., & Uddin, A. B. M. H. (2014). Antimicrobial activity of banana (*Musa paradisiaca* L.) peels against food borne pathogenic microbes. *J Pure Appl Microbio*, 8, 3627-3639.
2. Sastraprawira, S. M., Razak, I. H. A., Shahimi, S., Pati, S., Edinur, H. A., John, A. B., ... & Nelson, B. R. (2020). A review on introduced *Cichla* spp. and emerging concerns. *Heliyon*, 6(11).
3. JOHN, B. A., & WAZNAH, A. S. (2011). Accumulation and distribution of lead and copper in *Avicennia marina* and *Rhizophora apiculata* from Balok Mangrove Forest, Pahang, Malaysia. *Sains Malaysiana*, 40(6), 555-560.
4. Omar, S. M., Chowdhury, A. J. K., & Hashi, A. A. (2018). Islamic ethics of waste management towards sustainable environmental health. *IIUM Medical Journal Malaysia*, 17(1).
5. 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.
6. Gharibreza, M., Habibi, A., Imamjomeh, S. R., & Ashraf, M. A. (2014). Coastal processes and sedimentary facies in the Zohreh River Delta (northern Persian gulf). *Catena*, 122, 150-158.
7. Kamaruzzaman, B. Y., Ong, M. C., & Jalal, K. C. A. (2008). Levels of copper, zinc and lead in fishes of Mengabang Telipot River, Terengganu, Malaysia.
8. Kamaruzzaman, B. Y., Akbar, B., Jalal, K. C. A., & Shahbudin, S. (2010). Accumulation of metals in the gills of tilapia fingerlings (*Oreochromis niloticus*) from in vitro toxicology study. *Journal of fisheries and aquatic science*, 5(6), 503-509.
9. Malek, N. A., Chowdhury, A. J. K., Zainuddin, Z., & Abidin, Z. A. Z. (2014, December). Selective isolation of actinomycetes from mangrove forest of Pahang, Malaysia. In *International Conference on Agriculture, Biology and Environmental Sciences (ICABES'14): 2014; Indonesia*.

10. Ashraf, M. A., Balkhair, K. S., Chowdhury, A. J. K., & Hanafiah, M. M. (2019). Treatment of Taman Beringin landfill leachate using the column technique. *Desalination and Water Treatment*, 149, 370-387.
11. Fuloria, S., Sekar, M., Khattulanuar, F. S., Gan, S. H., Rani, N. N. I. M., Ravi, S., ... & Fuloria, N. K. (2022). Chemistry, biosynthesis and pharmacology of viniferin: potential resveratrol-derived molecules for new drug discovery, development and therapy. *Molecules*, 27(16), 5072.
12. Fuloria, S., Mehta, J., Talukdar, M. P., Sekar, M., Gan, S. H., Subramaniyan, V., ... & Fuloria, N. K. (2022). Synbiotic effects of fermented rice on human health and wellness: A natural beverage that boosts immunity. *Frontiers in Microbiology*, 13, 950913.
13. Selvaraj, S., Prasad, S., Fuloria, S., Subramaniyan, V., Sekar, M., Ahmed, A. M., ... & Fuloria, N. K. (2022). COVID-19 biomedical plastics wastes—challenges and strategies for curbing the environmental disaster. *Sustainability*, 14(11), 6466.
14. Hua, B. H., Sugumaran, S. V., Faryza, E., Atiqah, N., Jasvinder, 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.
15. 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.
16. 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.
17. Khan, M. F. K., & Maziz, M. N. H. (2019). Antibiotic resistance. LAP LAMBERT Academic Publishing.
18. 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.
19. 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).
20. 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).
21. Nellikunnel, S., Haldorai, K., Rahman, A., & Zangose, M. (2017). The country of origin effect on consumer purchase intention: PLS modelling. *International Journal of Business and Globalisation*, 19(3), 378-395.

22. URISH, W. P. T., SYRIAC, N. D., PARAMESWARAN, S., MARIA, J. W., & HANIM, N. B. (2020). Integrating UNSDG in International School's Curriculum: Nurturing a Sustainable Society in Malaysia. *GEOBIT*, 15(2), 194-212.
23. Xiaokang, S., & Nellikunnel, S. (2019). INNOVATIVE PACKAGING ATTRIBUTES AND CUSTOMER PURCHASE INTENTION IN SNACK FOODS. *Humanities & Social Sciences Reviews*, 7(2), 424-433.
24. Ramdass, R., Rahman, A., & Nellikunnel, S. (2015). Modelling critical success factors for a national qualifications framework: a case study on Mauritius. *International Journal of Modelling in Operations Management*, 5(3-4), 209-235.
25. Adetayo, A., Senathirajah, A. R. S., Devasia, S. N., & Haque, R. (2022). Modelling Consumer Perception of Service Quality in Banks. *Res Militaris, European Journal of Military Studies*, 12(2), 1357-1373.
26. Ibrahim, M. G., & Syriac, N. D. (2018). Adoption of CSR for Sustainable Development in the Nigerian Banking Sector: An Empirical Study. *INTI Journal*, 1(19).
27. Nelson, B. R., Zhong, J. M. H., Zauki, N. M., Satyanarayana, B. E. H. A. R. A., & Chowdhury, A. J. K. (2019). Effects of shore sedimentation to *Tachypleus gigas* (Müller, 1785) spawning activity from Malaysian waters. *Journal of Sustainability Science and Management*, 14(1), 41-60.
28. Amira, F. S., Rahman, M. M., Kamaruzzaman, Y., Jalal, K. C. A., Hossain, M. Y., & Khan, N. S. (2016). Relative abundance and growth of male and female *Nemipterus furcosus* population. *Sains Malaysiana*, 45(1), 79-86.
29. Zakaria, M. Z., Jalal, K. C. A., & Ambak, M. A. (2000). Length weight relationship and relative condition factor of *Sebarau, Hampala macrolepidota* (Van Hasselt) in Kenyir Lake, Malaysia. *Pakistan Journal of Biological Sciences*, 3(5), 721-724.
30. Zauki, N. A. M., Satyanarayana, B., Fairuz-Fozi, N., Nelson, B. R., Martin, M. B., Akbar-John, B., & Chowdhury, A. J. K. (2019). Horseshoe crab bio-ecological data from Balok, east coast peninsular Malaysia. *Data in brief*, 22, 458-463.
31. Akbar John, B., Kamaruzzaman, B. Y., Jalal, K. C. A., & Zaleha, K. (2012). TAL-a source of bacterial endotoxin detector in liquid biological samples. *International Food Research Journal*, 19(2), 423.
32. John, B. A., Sihin, S., Kamaruzzaman, B. Y., Jalal, K. C. A., & Zaleha, K. (2012). Sediment profiling of the nesting grounds of horseshoe crabs at East Peninsular Malaysia. *International Journal of Biology*, 4(2), 159.
33. Jalal, K. C. A., Faizul, H. N., Kamaruzzaman, B. Y., Shahbudin, S., Alam, M. Z., & Irwandi, J. (2009). Studies on physico-chemical characteristics and sediment environment along the coastal waters in Pulau Tuba, Langkawi, Malaysia. *Aquatic Ecosystem Health & Management*, 12(4), 350-357.

34. Laurie, K., Chen, C. P., Cheung, S. G., Do, V., Hsieh, H., John, A., ... & Yang, M. (2019). *Tachypleus tridentatus* (errata version published in 2019). The IUCN Red List of Threatened Species 2019: e. T21309A149768986.
35. Jalal, K. C. A., Akbar John, B., Nurul Lyana, M. S., Faizul, H. N., Noor Isma Yanti, M., Irwandi, J., & Bulbul, M. (2017). Comparative study on spoilage and pathogenic bacteria in selected commercial marine and freshwater fishes. *International Food Research Journal*, 24, 298.
36. Mohamamad, A., & Jalal, K. C. A. (2018). Macrobenthic diversity and community composition in the Pahang Estuary, Malaysia. *Journal of Coastal Research*, 82(SI), 206-211.
37. Salleh, S. M., Nishizawa, H., Ishihara, T., Sah, S. A. M., & Chowdhury, A. J. K. (2018). Importance of sand particle size and temperature for nesting success of green turtles in Penang Island, Malaysia. *Chelonian Conservation and Biology: Celebrating 25 Years as the World's Turtle and Tortoise Journal*, 17(1), 116-122.
38. Zaleha, K., Hazwani, I., Hamidah, H. S., Kamaruzzaman, B. Y., & Jalal, K. C. A. (2011). Effect of salinity on the egg hatching and Early Larvae of Horseshoe Crab *Tachypleus gigas* (Muller, 1785) in laboratory culture.
39. Abdurahman, S. W., Ambak, M. A., Sheriff, S. M., Mohamed, A. A., & Chowdhury, A. J. K. (2016). Morphological variations of plicofollis species (Siluriformes: Ariidae) in Peninsular Malaysia: An insight into truss network approach. *Sains Malaysiana*, 45(1), 1-7.
40. Chowdhury, A. J., Mohamed, A. A., John, A., & Yunus, K. B. (2011). Spatial variation and community composition of phytoplankton along the Pahang estuary, Malaysia. *Asian Journal of Biological Sciences*, 4, 468-476.
41. Jalal, K. C. A., Akbar John, B., Kamaruzzaman, B. Y., & Kathiresan, K. (2012). Emergence of Antibiotic Resistant Bacteria from Coastal Environment-A Review. *Antibiotic Resistant Bacteria-A Continuous Challenge in the New Millennium*. InTech, 143-158.
42. 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.
43. 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).
44. Rahman, S. A., Abdullah, N. A., Chowdhury, A. J. K., & Yunus, K. (2018). Fish scales as a bioindicator of potential marine pollutants and carcinogens in Asian sea bass and red tilapia within the coastal waters of Pahang, Malaysia. *Journal of Coastal Research*, 82(SI), 120-125.
45. Salleh, S. M., Nishizawa, H., Sah, S. A. M., & Chowdhury, A. J. K. (2020). Reproductive seasonality and environmental effects in green turtle (*Chelonia mydas*) nesting at Penang Island, Malaysia. *Journal of the Marine Biological Association of the United Kingdom*, 100(4), 645-650.

46. Rahman, M. M., Awang, M. B., Jalal, K. C. A., Aisha, S., & Kamaruzzaman, B. Y. (2013). Study on toxic chemicals in Kuantan River during pre and post monsoon season.
47. Kamarudin, M. K. A., Abd Wahab, N., Samah, M. A. A., Baharim, N. B., Mostapa, R., Umar, R., ... & Bati, S. N. A. M. (2020). Potential of field turbidity measurements for computation of total suspended solid in Tasik Kenyir, Terengganu, Malaysia. *Desalination and Water Treatment*, 187, 11-16.
48. Parven, M., Hossain, M. B., Rahman, M. F., Jalal, K. C. A., Jahan, N., & Amin, S. M. N. (2013). Limnological parameters affecting monthly abundance of chironomid larvae in a fish pond and their role in the diet of catfish, *Clarias batrachus*.
49. Chowdhury, A. J. K., Alam, M. Z., & Shahlizah, S. H. (2006, July). Isolation, purification and screening of fungal strain for effective bioconversion of palm oil mill effluent. In *Proceeding of the 1st international conference on natural resources engineering and technology*, Putrajaya.
50. Mustapha, S. N., John, A., Sheikh, H., Chowdhury, A. J. K., & Yunus, K. (2020). Acute-lethal toxicity test on juvenile *Oreochromis niloticus* exposed to Piper betle extract under static exposure. *Ecofeminism and Climate Change*, 1(2), 79-87.
51. Ab Rahman, N., Chowdhury, A. J. K., Abidin, Z. A. Z., & Azira, Z. (2015). Antibiotic resistant bacteria from sediment of coastal water of Pahang, Malaysia. *Jurnal Teknologi*, 77(24), 65-70.
52. John, A., Chowdhury, A. J. K., Asri, U. N. M., Nordin, N. F. H., & Ambak, M. A. (2015). DNA BARCODING OF CAGED PANGASIIDS IN PAHANG RIVER MALAYSIA. *Jurnal Teknologi*, 77(25), 31-36.
53. Shahbudin, S., Zuhairi, A., Kamaruzzaman, Y., & Jalal, K. C. A. (2009, October). Impact of coastal development on mangrove distribution in Kuantan, Pahang. In *International Workshop on Integrated Coastal Zone Management* (pp. 20-22).
54. CHOWDHURY, A. J. K. (2008). Seasonal bed sediment characteristics of the Kuala Sepetang River, Perak. *Sains Malaysiana*, 37(2), 143-147.
55. Mahmud, N. S., Abdullah, S. Z., Jalal, K. C. A., Rimatulhana, R., & Amal, M. N. (2019). Assessment of Bacteria and Water Quality Parameters in Cage Cultured *Pangasius hypophthalmus* in Temerloh, Pahang River, Malaysia. *Nature Environment & Pollution Technology*, 18(5), 1479.
56. Siddiquee, M. M., Rahman, M. F., Jahan, N., Jalal, K. C., Amin, S. M., & Arshad, A. (2012). Impact of exotic carps in the polyculture with indigenous carps: competition for food. *Pakistan Journal of Biological Sciences: PJBS*, 15(12), 568-575.
57. Yunus, K., Suhaimi, M., Zahir, M., John, A., Khan Chowdhury, A. J., Saad, S., & Goddard, J. S. (2011). Bioaccumulation of some metals by Green mussel *Perna viridis* (Linnaeus 1758) from Pekan, Pahang, Malaysia. *International Journal of Biological Chemistry*, 5(1), 54-60.

58. Kamaruzzaman, B. Y., Hasrizal, B. S., Nizam, B. M., Ong, M. C., Jalal, K. C. A., & Shahbuddin, S. (2009). Geochemical proxy of sediment cores from Terengganu coastal water, Malaysia. *Oriental Journal of Chemistry*, 25(1), 9.
59. Abidin, Z. Z., Malek, N. A., Zin, N. M., & Chowdhury, A. J. K. (2020). Rare Actinomycetes from Kuantan Mangrove Forest Sediment. *Clean WAS*, 4, 79-83.
60. Ashraf, M. A., Amescua García, C. M., & Chowdhury, A. J. K. (2019). Introduction environment, development and sustainability. *Revista Internacional de Contaminación Ambiental*, 35, 7-9.
61. Salleh, S. M., Sah, S. A. M., & Chowdhury, A. J. K. (2022). The survival rate from splitting clutch design method for green turtle's relocated nest in Penang Island, Malaysia. *Tropical Life Sciences Research*, 33(3), 107.
62. Tosin, O. V., Mohamed, A. A., Ariffin, N. A., Chowdhury, A. J. K., & Bolong, A. M. A. (2022). Morphological variation between hatchery bred and wild caught *Anabas testudineus* in Malaysia. *Tropical Life Sciences Research*, 33(1), 201.
63. Jalal, K. C. A., John, A., Hassan, B., Sheikh, I., Shahbudin, S., & Nor Hafiza, Y. A. A. (2017). Study on physicochemical parameters and distribution of phytoplankton in Kuantan estuary, Pahang. *Environment and Ecosystem Science*, 1(1), 8-12.
64. Hassan, M. A. R. I. N. A., Sharoum, F. M., Abd Wahid, M. E., Ghaffar, M. A., Ambak, M. A., & Musa, N. (2017). Infestation ff *Probopyrus* sp. on *Macrobrachium lanchesteri* From Sungai Chalok and Sungai Nyatoh, Terengganu, Malaysia. *J Sustain Sci Manag*, 3, 111-118.
65. Hoque, M. M., Motin, M. A., Maya, M., Sarkar, M. R., Islam, M. R., Chowdhury, M. T. H., & Chowdhury, A. J. K. (2014). Water quality and plankton composition of *Amblypharyngodon mola* monoculture fish pond in Bangladesh. *International Journal of Emerging Trends in Science and Technology*, 1(7), 1005-1014.
66. Ahmed, O. H., Ali, M., Abdullah, R., Chowdhury, A. J. K., Salleh, N. T., & Musah, A. A. (2022). Co-application of triple super phosphate and chicken litter biochar improves phosphorus availability of mineral tropical acid soils to reduce water pollution. *Desalination and Water Treatment*, 264, 40-53.
67. Roslan, M. A. M., Abidin, Z. A. Z., & Omar, S. M. (2016). Screening of ligninase-producing bacteria from south east Pahang peat swamp forest soil. *Malaysian Journal of Microbiology*, 433-437.
68. Abidin, Z. A. Z., Ahmad, A., Usup, G., & Chowdhury, A. J. K. (2021). Marine actinomycetes from Malaysia marine environments with antagonistic potential. *Desalin Water Treat*, 219, 51-59.
69. Ashraf, M. A., & Aqma, W. S. (Eds.). (2017). *Environmental Conservation, Clean Water, Air & Soil (CleanWAS)*. Iwa Publishing.

70. Chowdhury, A., Hazra, A. K., & Nandi, A. P. (2010). New record of the earthworm *Drawida papillifer papillifer* Stephenson from West Bengal, India. *Journal of Threatened Taxa*, 2(2), 716-717.