

## Association of Healthcare System Factors and Perceptual Factors with Regular Check-up Practice among Nursing Staff

Ali A. Joumaa<sup>1</sup>, Selman H. Faris<sup>2</sup>

<sup>1</sup> Master Student, Department of Community Health Nursing, College of Nursing, University of Kerbala, Kerbala, Iraq.

Email: [ali.ahmad@s.uokerbala.edu.iq](mailto:ali.ahmad@s.uokerbala.edu.iq)

<sup>2</sup> Department of Community Health Nursing, College of Nursing, University of Kerbala, Kerbala, Iraq.

Email: [selman.hussein@uokerbala.edu.iq](mailto:selman.hussein@uokerbala.edu.iq)



**Received:** 03/04/2026

**Accepted:** 07/05/2026

**Published:** 03/06/2026

**DOI:**

[https://doi.org/10.65682/](https://doi.org/10.65682/kjnhs.v2.i2.1-17)

[kjnhs.v2.i2.1-17](https://doi.org/10.65682/kjnhs.v2.i2.1-17)

### Abstract

**Background:** Regular check-up practice support early detection and risk control. However, nurses may not do them consistently. This study aimed to assess healthcare system (HCS) determinants and Health Belief Model (HBM) based perceptual factors related to regular check-up practice among nursing staff.

**Objective:** To assess HCS factors and HBM-based perceptual factors associated with regular check-up practice among nursing staff in selected hospitals in Kerbala Governorate, Iraq.

**Methods:** A descriptive analytic cross-sectional study was conducted in three hospitals in Kerbala Governorate, Iraq. A simple random sample included 313 nurses. A self-administered questionnaire measured HCS determinants, perceptual factors, and regular check-up practice, in addition to sociodemographic and work characteristics. Data were analyzed using IBM SPSS Statistics (Version 27). Descriptive statistics and non-parametric tests were used. Spearman correlation was applied to assess associations between the study variables.

**Results:** Perceived HCS support was low (mean = 1.83), while perceptual factors were high (mean = 4.38). Regular check-up practice was fair (mean = 2.73), and 39.0% of the participants had good practice. The organizational and administrative factor showed the strongest positive correlation with overall regular check-up practice (Spearman's rho = 0.356,  $p < 0.001$ ).

**Conclusion:** Regular check-up practice among nurses was linked to both institutional support and health perceptions. Organizational and administrative support showed the clearest link. Improving internal staff health services, scheduling, and follow-up may help strengthen regular check-up practice.

**Keywords:** Regular check-up practice; nursing staff; healthcare system; perceptual factors; health belief model.



## 1. Introduction

Preventive medicine is a major part of modern healthcare, and it includes primary and secondary prevention such as early detection to minimize the burden of disease and related risk factors (World Health Organization, 2025)(World Health Organization, 2025). Early detection can be supported through evidence-based screening in individuals without symptoms so that early action can be offered when needed (Organization, 2020). Periodic health examinations or regular check-up practice are planned preventive assessments that can help identify early health problems and support actions that reduce future health risks (Araujo et al., 2025). This is relevant to nursing staff because nurses' health is an essential professional resource and a policy priority for the health workforce, and protecting health worker health and well-being can support patient safety and quality of care (WHO, 2022).

Nurses play an important role in health services and health promotion. Nurses educate patients and can influence preventive behaviours in daily care. For this reason, nurses are often expected to model preventive practices, including regular health evaluation (Lukewich et al., 2022; Pender et al., 2015). However, many nurses do not follow regular check-ups, and studies from different settings reported low attendance for periodic examinations, suggesting that health knowledge alone may not be enough to ensure regular check-ups or other preventive behaviours (Ahmed et al., 2025; Ojong et al., 2020).

Regular check-up practice among nurses can be affected by workplace conditions and personal perceptions. In hospitals, participation may depend on system support such as access during work time, clear scheduling, follow-up, and leadership support. High workload and staffing limits may also reduce engagement (Bleier et al., 2023; Ellis et al., 2023). Personal beliefs also matter. The HBM explains preventive behaviour through key beliefs, including perceived susceptibility and severity, perceived benefits and barriers, cues to action, and self-efficacy (Alyafei & Easton-Carr, 2024; Fadil & Oleiwi, 2025). Evidence from healthcare workers, including nurses, shows that these beliefs are associated with preventive screening behaviour (Alshamlan et al., 2023). Workplace support and service quality may also influence check-up uptake, such as the availability of committed providers and well-managed periodic examination processes, which act as crucial external cues that reinforce personal preventive habits (Getahun et al., 2023; Toniasso et al., 2022).

In Iraq, healthcare resources remain limited, and many hospitals rely on older equipment and have restricted access to medicines and basic services, which can leave nurses working with limited managerial support and limited essential supplies and equipment (Alkhaqani, 2023). Local evidence also shows gaps in occupational hazard prevention measures and limited access to training among healthcare professionals, which suggests weaknesses in occupational health practice in hospital settings (Abed-Al Sattar et al., 2023; Lefta et al., 2021). Community screening data also indicate increasing rates of hypertension, diabetes, and obesity, and nursing staff share the same community environment and related health risks as the wider population (Khaleel et al., 2024). At the same time, nursing staff work in hospital environments where healthcare workers are exposed to biological, chemical, ergonomic, and psychosocial hazards, which supports the need for occupational health and safety systems that include ongoing risk assessment, preventive programs, and supportive organizational leadership (Sabri Shamkh et al., 2022; Yeşilgöz & Arga, 2025). However, a significant knowledge gap persists in the local and regional literature; while prior Iraqi studies have predominantly focused on community-based, single-condition screenings such as mammography in Sulaymaniyah or diabetes screening in Duhok (Ali & Fateh, 2022; Khaleel et al., 2024), or specific

occupational infectious exposures like Hepatitis B (Almufty et al., 2019). There is a critical dearth of empirical research quantifying comprehensive, multi-system periodic medical check-ups among nursing staff within complex hospital shift environments. Furthermore, existing local applications of the HBM remain confined to non-clinical or community settings (Fadil & Oleiwi, 2025; Taher et al., 2023), without integrating these psychological perceptions with institutional HCS barriers into a single explanatory framework (Jang, 2022; West & Michie, 2021). To bridge this structural and empirical gap, the present study explicitly quantifies regular multi-system check-up practices among nursing staff in Kerbala hospitals and models their simultaneous associations with both HCS organizational dynamics and HBM-based perceptual determinants.

### 1.1. Objectives of the Study

1. To assess HCS factors that support regular check-up practice among nursing staff.
2. To examine perceptual factors influencing regular check-up practices among nursing staff.
3. To determine the frequency and patterns of regular check-up practices among nursing staff.
4. To assess the associations of HCS factors and perceptual factors with regular check-up practice among nursing staff.
5. To identify the association between regular check-up practice among nursing staff and their demographic data.

### 2. Methodology

A cross-sectional descriptive analytic design was used to describe regular check-up practice and to test the associations between HCS factors, perceptual factors, and check-up practice among nursing staff. The research was conducted during the 2025–2026 academic year in Kerbala Governorate at Imam Al-Hussein Medical City, Kerbala Teaching Hospital for Children, and the Maternity and Gynecology Teaching Hospital. A probability simple random sample was selected. The total nursing population in the three hospitals was 1670, and the required sample size was calculated using Thompson, (2012) formula for finite populations (95% confidence level,  $z = 1.96$ ; margin of error  $d = 0.05$ ;  $P = 0.50$ ). The final sample was 313 nurses, and it was distributed proportionally across the hospitals (150 from Imam Al-Hussein Medical City, 79 from the Children's Hospital, and 84 from the Maternity and Gynecology Hospital). To ensure methodological rigor and adhere to the STROBE guidelines, a strict multi-stage screening and collection process was implemented. To maintain the integrity of the simple random sampling, all names registered on the official hospital employment lists were eligible for selection, and no clinical or administrative exclusions were applied. To maintain the active sampling frame and prevent missing data bias, an expanded randomized pool of potential participants (e.g., 200 names for a target hospital requiring 150 respondents) was initially secured. Fieldwork was conducted through consecutive daily site visits across morning, evening, and night shifts. Questionnaires were evaluated immediately upon collection, and a sequential replacement strategy was utilized from the pre-selected randomized pool to replace incomplete instruments on-site until the exact calculated quota for each hospital was fulfilled with 100% complete responses. Nurses who agreed to participate and signed consent were included. Data were collected using a self-administered questionnaire delivered face-to-face. The tool had four parts: Part I included demographic information. Part II measured HCS factors using 10 items on a 4-point frequency scale (Always, Often, Rarely, Never). The researcher created these items, drawing on Clark (2015), as a reference. The items were also mapped to the WHO and International Labour Organization (ILO)

framework for protecting the health and safety of health and care workers (WHO & ILO, 2022). Part III measured perceptual factors using a 6-item HBM -based scale adopted from Tayoun (2025). Responses were rated on a 5-point Likert scale with a total score ranging from 6 to 30. Each of the six items was designed to measure one distinct dimension of the health belief model. For statistical analysis and data presentation efficiency, responses to these six individual components were analyzed independently and clustered during data presentation into three paired conceptual dimensions for enhanced structural clarity. Part IV measured regular check-up practice using five frequency items (WHA, 2017) and one time-since-last-routine-check-up item adapted from Behavioural Risk Factor Surveillance System (BRFSS) (Centers for Disease Control and Prevention, 2023), and one open-ended question on suggestions to improve nurses' commitment. To ensure mathematical consistency when calculating the composite mean for practice, a Linear Scale Transformation (proportional adjustment) was applied to the originally 5-point Item 6 (time elapsed since last check-up), mathematically transforming it into an equivalent 4-point metric to unify its statistical weight with the other five items. Face and content validity was checked by an expert panel of 11 specialists. A pilot study was carried out on 30 nurses (10 from each hospital) to test clarity and feasibility, and it showed satisfactory internal consistency (HCS  $\alpha = 0.903$ , perceptual factors  $\alpha = 0.800$ , and practice  $\alpha = 0.825$ ). Data were coded and analyzed using SPSS version 27. Descriptive statistics were presented as frequencies, percentages, means, and standard deviations. To classify the mean scores into descriptive levels (low, moderate, high), the Equal Interval Range Formula ( $\text{\$Range} \div 3$ ) was utilized. For the 4-point scales (HCS and Practice), the interval length was 1.00, yielding cut-offs of: Low/Poor (1.00–2.00), Moderate/Fair (2.01–3.00), and High/Good (3.01–4.00). For the 5-point scale (Perceptual factors), the interval length was 1.33, establishing the thresholds as: Low (1.00–2.33), Moderate (2.34–3.66), and High (3.67–5.00). The Kolmogorov–Smirnov test was used to test normality. Spearman correlation was used to test associations between the main scales, while Mann–Whitney U and Kruskal–Wallis tests were used for group comparisons. Statistical significance was set at  $p < 0.05$ . Ethical approval was obtained from the University of Kerbala, College of Nursing Research Ethical Committee (UOK.CON.25.0102, 16/11/2025) in strict accordance with the ethical principles of the Declaration of Helsinki, and official administrative permissions were obtained before data collection, followed by obtaining written informed consent from all participants.

### 3. The Results

In Table 1 the results showed the most of the 313 nursing staff were aged (65.2%) from 25 to 34 years with a mean age of 32.67 years, and most (36.4%) nursing staff had from five to ten years' experience. Regarding sex, the most (61.3%) were female. The results showed the participants at most (67.7%) were married and the most (56.2%) with barely sufficient monthly income. According to the educational level, most (51.8%) had completed a Bachelor of Nursing. And, the findings indicate most worked in critical care, medical ward, and emergency with a mean of 148.35 monthly working hours. And, most (51.8%) nursing staff working on the evening shift. Also, the findings indicate majority (88.5%) participant without chronic disease and also most (43.1%) reported no family history of chronic diseases, and finally, 69.3% of the participants had undergone a medical examination upon employment.

**Table 1.** Distribution of the nursing staff according to their demographic and work information data characteristics.

| Data   | Subgroup                        | f.                  | %           |
|--|---------------------------------|---------------------|-------------|
| Age  | Mean $\pm$ SD                   | 32.67 $\pm$ 7.692   |             |
|  | Min - Max                       | 22 - 58 years       |             |
| Sex  | Male / Female                   | 121 / 192           | 38.7 / 61.3 |
|  | Single / Married                | 90 / 212            | 28.8 / 67.7 |
| Marital status   | Divorced / Widowed              | 9 / 2               | 2.9 / .6    |
|  | Educational level               | Preparatory Nursing | 50          |
| Nursing Diploma  |                                 | 88                  | 28.1        |
| Bachelor of Nursing  |                                 | 162                 | <u>51.8</u> |
| Master of Nursing  |                                 | 13                  | 4.2         |
| Years of experience  |                                 | less than 5 years   | 101         |
| Years of experience  | 5 – 10 / 11 – 15 years          | 114 / 41            | 36.4 / 13.1 |
|  | 16 – 20 years                   | 28                  | 8.9         |
|  | More than 20 years              | 29                  | 9.3         |
|  | Mean $\pm$ SD                   | 9.30 $\pm$ 7.280    |             |
|  | Min - Max                       | 1 - 38 years        |             |
| Workplace inside the hospital/health unit  | Dialysis                        | 21                  | 6.7         |
|  | Outpatient Consultation Clinics | 10                  | 3.2         |
|  | Surgical Wards                  | 42                  | 13.4        |
|  | Medical Wards                   | 55                  | 17.6        |
|  | Operating Theatre               | 26                  | 8.3         |
|  | Nursing Administration          | 16                  | 5.1         |
|  | Paediatrics/Neonatal            | 18                  | 5.8         |
|  | Critical Care                   | 56                  | <u>17.9</u> |
|  | Emergency                       | 51                  | 16.3        |
|  | Labor and Delivery Unit         | 18                  | 5.8         |
| Monthly working hours  | Mean $\pm$ SD                   | 148.35 $\pm$ 17.930 |             |
|  | Min - Max                       | 114 - 192 hours     |             |
| Family history of chronic diseases   | None                            | 135                 | <u>43.1</u> |
|  | Diabetes / Hypertension         | 100 / 60            | 31.9 / 19.2 |
|  | heart diseases / Cancer         | 8 / 10              | 2.6 / 3.2   |
| Income   | Sufficient                      | 50                  | 16.0        |
|  | Barely / Not sufficient         | 176 / 87            | 56.2/ 27.8  |
| Did the health institution conduct a medical examination for you at the start of work? | No                              | 96                  | 30.7        |
|  | Yes                             | 217                 | <u>69.3</u> |
|  | Total                           | 313                 | 100.0       |

f= frequencies, %=Percentages, M = Mean of score, S.D = Standard Deviation, Min= minimum and Max= maximum

The results in Table 2 showed that the assessment of HCS factors that assist in the implementation of regular check-up practice among nursing staff was low, with a mean score of 1.83 (Min–Max = 1–4).

**Table 2.** Assessment of HCS factors that support regular check-up practice among nursing staff.

| Items   | %     |        |       |        | Mean        | Ass. |
|---|-------|--------|-------|--------|-------------|------|
|   | Never | Rarely | Often | Always |             |      |
| 1. My institution provides regular check-up services that include essential preventive examinations targeted to nursing staff.  | 50.8  | 24.6   | 18.8  | 5.8    | 1.80        | L    |
| 3. My institution implements an effective system to follow up and monitor exposure to occupational risks by conducting regular preventive check-ups aimed at early detection of any potential health effects.   | 58.8  | 24.6   | 11.2  | 5.4    | 1.63        | L    |
| 4. Regular check-ups for nurses in my institution are implemented through an organized mechanism based on a specific, approved schedule.  | 65.2  | 19.5   | 12.5  | 2.9    | 1.53        | L    |
| 7. My institution has effective coordination between the occupational health unit and external health services when specialized examinations or consultations are needed.   | 62    | 21.4   | 11.2  | 5.4    | 1.60        | L    |
| 8. Hospital management encourages nurses to undergo preventive and regular check-ups regularly by providing clear and transparent information about required examinations and implementing organized awareness activities that explain the importance and preventive role of check-ups. | 43.8  | 28.8   | 16.9  | 10.5   | 1.94        | L    |
| Organizational & Administrative Factor  |       |        |       |        | <b>1.70</b> | L    |
| 2. My institution adequately funds regular check-ups to ensure their continuity, so that I do not bear any financial costs when undergoing them.  | 53.7  | 18.8   | 15    | 12.5   | 1.86        | L    |
| 6. The health insurance in my institution fully covers the costs of regular check-ups and preventive examinations.  | 56.9  | 17.6   | 19.8  | 5.8    | 1.74        | L    |
| Financial Support Factor  |       |        |       |        | <b>1.80</b> | L    |
| 5. I can easily access regular check-up services within my workplace, with easy booking and appointment availability during my working hours.   | 31    | 27.8   | 25.9  | 15.3   | 2.26        | M    |
| 9. My institution provides clear mechanisms and appropriate services to deal with emergency health conditions that may be detected during regular or preventive check-ups   | 39.9  | 24.9   | 25.6  | 9.6    | 2.05        | M    |
| 10. My institution provides medical support and the necessary therapeutic follow-up to restore health after any health problem is detected during regular check-ups.  | 46    | 28.1   | 18.8  | 7      | 1.87        | L    |
| Accessibility & Follow-up Factor  |       |        |       |        | <b>2.06</b> | M    |
| Overall   |       |        |       |        | <b>1.83</b> | L    |

Ass. = Assessment items, L = Low support (1 – 2), M = Moderate support (2.01 – 3), and H= High support (3.01 - 4).

The results in Table 3 showed that the assessment of level of the perceptual factors influencing regular check-up practices among nursing staff was high, with a mean of 4.38 (Min - Max 1 - 5).

**Table 3.** Level of perceptual factors related to regular check-up practice among nursing staff.

| Items  | %                 |          |         |       |                | Mean        | Ass. |
|--|-------------------|----------|---------|-------|----------------|-------------|------|
|  | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |             |      |
| 1. Even if my health is good and I have no symptoms, I should see a doctor annually or every few years to check on my health   | 0.6               | 1        | 1.3     | 35.5  | 61.7           | 4.57        | H    |
| 2. Many diseases, if not treated, lead to serious complications or death.<br>Perceived Severity & Susceptibility Factor  | 0                 | 0        | 1.9     | 34.5  | 63.6           | 4.62        | H    |
| 3. Regular health check-ups make me feel reassured about my health   | 0                 | 0.6      | 4.5     | 34.2  | 60.7           | 4.55        | H    |
| 4. Many diseases, if detected early, are curable.<br>Perceived Benefits & Cues to Action Factor  | 1.3               | 1.3      | 9.3     | 38    | 50.2           | 4.35        | H    |
| 5. I can allocate enough time to perform routine health screening.   | 2.2               | 6.4      | 20.1    | 44.1  | 27.2           | 3.88        | H    |
| 6. I am not afraid of discovering a disease through regular health check-ups because early detection is better than late discovery:<br>Perceived Barriers & Self-Efficacy Factor | 0.3               | 1.9      | 10.2    | 37.4  | 50.2           | 4.35        | H    |
| Overall  |                   |          |         |       |                | <b>4.11</b> | H    |
|  |                   |          |         |       |                | <b>4.38</b> | H    |

Ass. = Assessment items, L = Low Perception (1 – 2.33), M = Moderate Perception (2.34 – 3.66), and H= High Perception (3.67 - 5).

The results in Table 4 showed that regular check-up practice among nursing staff was fair, with a mean score of 2.73 (Min–Max = 1–4).

**Table 4.** Frequency and patterns of regular check-up practices among nursing staff.

| Items  | %     |        |       |        | Mean | Ass. |
|--|-------|--------|-------|--------|------|------|
|  | Never | Rarely | Often | Always |      |      |
| 2. I participate in any regular check-up program if the hospital provides it.  | 11.2  | 27.8   | 36.4  | 24.6   | 2.74 | F    |
| 4. I document completing the regular check-up with the occupational health unit or in the hospital system, if available.<br>Institutional Compliance | 20.1  | 17.6   | 33.5  | 28.8   | 2.71 | F    |
| 1. I undergo regular check-up practice even when I have no symptoms.   | 30.4  | 29.7   | 25.6  | 14.4   | 2.24 | F    |
| 3. I keep my scheduled check-up appointments and avoid postponement.   | 12.8  | 22.7   | 35.1  | 29.4   | 2.81 | F    |
| 5. I review my check-up results and take the recommended actions in a timely manner.   | 10.9  | 11.8   | 35.1  | 42.2   | 3.09 | G    |

|  | Never | ≥ 5 y | 2 - < 5 y | 1 - < 2 y | < 1 y | Mean        | Ass.        |
|--|-------|-------|-----------|-----------|-------|-------------|-------------|
| 6. How long has it been since your last visit for a general regular check-up practice ?                                | 16.9  | 8.9   | 16        | 27.2      | 31    | 3.46/5      | F           |
| Self-Initiated Practice  |       |       |           |           |       | ↓<br>2.77   |             |
| Overall  |       |       |           |           |       | <b>2.73</b> | F           |
| What measures could enhance nurses' adherence to regular check-up practice ?   |       |       |           |           |       |             |             |
| Suggestion   |       |       |           |           |       | <b>F</b>    | <b>%</b>    |
| No clear suggestion / I don't know   |       |       |           |           |       | 33          | 10.5        |
| Provide an on-site regular check-up program within the hospital/workplace to improve access and reduce time loss.      |       |       |           |           |       | 102         | <u>32.6</u> |
| Allocate protected time during duty hours and set an annual or semi-annual schedule that fits all shifts.              |       |       |           |           |       | 56          | 17.9        |
| Offer tests free of charge or at low cost, supported by financial coverage or health insurance for staff.              |       |       |           |           |       | 41          | 13.1        |
| Simplify check-up procedures, reduce bureaucracy, and ensure a clear process with timely results.                      |       |       |           |           |       | 31          | 9.9         |
| Implement formal mandatory policies, with administrative or HR follow-up and documentation of compliance.              |       |       |           |           |       | 13          | 4.2         |
| Increase awareness through education sessions, provide appropriate incentives, and ensure privacy and confidentiality. |       |       |           |           |       | 37          | 11.8        |
| Total  |       |       |           |           |       | 313         | 100%        |

Ass. = Assessment, P Poor Practice (1 – 2), F = Fair Practice (2.01 – 3), and G= Good Practice (3.01 - 4).

In Table 5 the results indicate a moderate, positive, and statistically significant association between the Organizational & Administrative Factor and all dimensions of regular check-up practices. The strongest relationship was observed with overall regular check-up practices (Cc = 0.356, p < 0.001), followed by self-initiated practice (Cc = 0.343, p < 0.001) and institutional compliance (Cc = 0.307, p < 0.001).

**Table 5.** The association between HCS factors, and perceptual factors, with regular check-up practices among nursing staff.

| N=313                                  | Regular Check-up Practices |      |             |                         |      |              |         |      |             |
|--|----------------------------|------|-------------|-------------------------|------|--------------|---------|------|-------------|
|  | Institutional Compliance   |      |             | Self-Initiated Practice |      |              | Overall |      |             |
|  | Cc                         | Sig. | 95% CI      | Cc                      | Sig. | 95% CI       | Cc      | Sig. | 95% CI      |
| Organizational & Administrative Factor | .307                       | .000 | 0.203–0.404 | .343                    | .000 | 0.241–0.437  | .356    | .000 | 0.255–0.449 |
| Financial Support Factor               | .137                       | .015 | 0.027–0.244 | .106                    | .060 | -0.005–0.214 | .130    | .022 | 0.019–0.237 |
| Accessibility & Follow-up Factor       | .169                       | .003 | 0.059–0.275 | .196                    | .000 | 0.087–0.300  | .204    | .000 | 0.095–0.308 |

|  | Regular Check-up Practices |      |             |                         |      |              |         |      |             |
|--|----------------------------|------|-------------|-------------------------|------|--------------|---------|------|-------------|
|  | Institutional Compliance   |      |             | Self-Initiated Practice |      |              | Overall |      |             |
|  | Cc                         | Sig. | 95% CI      | Cc                      | Sig. | 95% CI       | Cc      | Sig. | 95% CI      |
| HCS Factors(Overall)                       | .219                       | .000 | 0.111–0.322 | .245                    | .000 | 0.138–0.346  | .256    | .000 | 0.149–0.357 |
| Perceived Benefits & Cues to Action Factor | .170                       | .003 | 0.060–0.276 | .225                    | .000 | 0.117–0.328  | .222    | .000 | 0.114–0.325 |
| Perceived Severity & Susceptibility Factor | .110                       | .051 | 0.001–0.218 | .108                    | .057 | -0.003–0.216 | .119    | .036 | 0.008–0.227 |
| Perceived Barriers & Self-Efficacy Factor  | .242                       | .000 | 0.135–0.344 | .183                    | .000 | 0.074–0.288  | .224    | .000 | 0.116–0.327 |
| Perceptual Factors (Overall)               | .250                       | .000 | 0.143–0.351 | .250                    | .000 | 0.143–0.351  | .272    | .000 | 0.166–0.372 |

Cc = Spearman's Correlation Coefficient, P=probability value, NS: Non-Significant at  $P \geq 0.05$ , S: Significant, CI = 95% Confidence Interval

The results in Table 6 showed significant associations between regular check-up practice among nursing staff and some sociodemographic and work-related characteristics, particularly education level, workplace unit, and family history of chronic diseases.

**Table 6.** Associations between regular check-up practice among nursing staff and their sociodemographic characteristics.

| Data                | Subgroup                     | Regular Check-up |           |                   |
|---------------------|------------------------------|------------------|-----------|-------------------|
|                     |                              | Mean             | Analysis  | Sig.              |
| Age group           | 18–24 / 25–34                | 2.65 / 2.71      | Cc= .019  | .736 <sup>a</sup> |
|                     | 35–44 / 45–59                | 2.92 / 2.58      |           |                   |
| Sex                 | Male / Female                | 2.75 / 2.71      | Z= -.232- | .816 <sup>b</sup> |
|                     | Single / Married             | 2.78 / 2.71      |           |                   |
| Educational level   | Divorced / Widowed           | 2.79 / 2.23      | H= 22.321 | .000 <sup>c</sup> |
|                     | Preparatory Nursing          | 3.08             |           |                   |
|                     | Nursing Diploma              | 2.76             |           |                   |
|                     | Bachelor / Master of Nursing | 2.66 / 2.01      |           |                   |
| Years of experience | less than 5 years            | 2.70             | Cc= .009  | .870 <sup>a</sup> |
|                     | 5 – 10 / 11 – 15 years       | 2.76 / 2.65      |           |                   |
|                     | 16 – 20 / More than 20 years | 3.09 / 2.43      |           |                   |
|                     | Dialysis                     | 3.02             |           |                   |

| Data   | Subgroup  | Regular Check-up           |          |                   |
|--|---|----------------------------|----------|-------------------|
|  |   | Mean                       | Analysis | Sig.              |
| Workplace inside the hospital/health unit  | Outpatient Consultation Clinics                 | 2.85                       | H=       | 21.201            |
|  | Surgical Wards                                  | 2.49                       |          |                   |
|  | Medical Wards                                   | 2.71                       |          |                   |
|  | Operating Theatre                               | 2.58                       |          |                   |
|  | Nursing Administration                          | 3.39                       |          |                   |
|  | Paediatrics/Neonatal                            | 2.43                       |          |                   |
|  | Critical Care                                   | 2.76                       |          |                   |
|  | Emergency                                       | 2.75                       |          |                   |
|  | Labor and Delivery Unit                         | 2.65                       |          |                   |
| Monthly working hours  |   | 2.73                       | Cc= .029 | .610 <sup>a</sup> |
| Family history of chronic diseases   | None  | 2.91                       | H=       | .000 <sup>c</sup> |
|  | Diabetes / Hypertension heart diseases / Cancer | 2.42 / 2.56<br>3.75 / 3.50 | 30.914   |                   |
| Income   | Sufficient                                      | 2.85                       | H= 1.696 | .428 <sup>c</sup> |
|  | Barely / Not sufficient                         | 2.72 / 2.67                |          |                   |
| Did the health institution conduct a medical examination for you at the start of work? | No  | 2.71                       | Z=       | .495 <sup>b</sup> |
|  | Yes   | 2.74                       | -.683-   |                   |

P=probability value, NS: Non-Significant at  $P \geq 0.05$ . a=P. value was calculated by Spearman's correlation coefficient, b=P. value was calculated by Mann-Whitney U, c=P. value was calculated by Kruskal-Wallis H.

#### 4. Discussion

This study assessed regular checkup practice among nursing staff. It also examined how HCS factors and HBM perceptual factors are related to this practice. Nurses reported strong beliefs about checkups, but their routine practice was only fair. Support at the workplace showed the clearest link with practice. Local evidence also shows that a better workplace safety climate is linked to better job performance among nursing staff (Salih Mahdi & Faris, 2024).

Table 1 shows that most participants were 25 to 34 years (65.2%), with a mean age of 32.67 years (SD 7.692; range 22–58). Females were the majority (61.3%), and most were married (67.7). Similar profiles were reported in other settings (Getahun et al., 2023). Half of the nurses held a Bachelor of Nursing (51.8%). Many worked in high-demand units like critical care, medical wards, and emergency, and 69.3% reported a medical examination at the start of work. This indicates that entry screening is present, but it is not provided to all staff.

Table 2 indicates that perceived HCS support of regular check-ups is low (overall mean = 1.83). The weakest area was the organizational and administrative domain. The approved schedule item, for example, had a low mean (1.53). In practical terms, this suggests that regular check-ups for nurses are not delivered through a stable and well-organized system.

This pattern is not unique. In Brazil, workers reported weak steps in the pathway of periodic examinations, especially problems related to scheduling and reception processes (Toniasso et al., 2022). In South African public hospitals, nurses also described weak occupational health and safety actions, with limited guidance and training on procedures (Denge & Rakhudu, 2022). These findings match the main message in our results.

Access during working hours was relatively better than other items (mean = 2.26). Still, access alone does not make a program regular if key steps are missing, such as a clear schedule, reminders, documentation, and follow-up. Time pressure and workload can also reduce the use of screening services, even when services are available (Marevesa & Mhlanga, 2024). Overall, Table 2 suggests that some elements of support exist, but the system is not strong enough to make check-ups a routine service across units and shifts. This is consistent with evidence that workplace programs need organizational support and practical delivery arrangements, not only individual motivation (Virtanen et al., 2025).

Table 3 indicates that there are high perceptual factors (overall mean = 4.38). Nurses strongly agreed with the seriousness of disease and the value of early detection. This result fits what HBM studies often report. Health workers can have strong beliefs about disease seriousness (Alshamlan et al., 2023). Still, the lowest item was time feasibility (mean = 3.88). This points to a time and feasibility barrier, not a rejection of prevention.

Cues to action and practical triggers can help move beliefs into action. In Ethiopia, screening uptake was linked to practical triggers such as training and real exposure to screening contexts, which fit the idea of cues to action (Aytenuw et al., 2024). Other studies also highlight that barriers related to service access and fear can reduce screening uptake among nurses and midwives (Nyaaba & Akurugu, 2023). In summary, beliefs were high in this sample, but time and practical feasibility were the main weaker points.

Table 4 shows that regular check-up practice was fair (overall mean = 2.73). In this study, 39.0% had good practice, 36.7% had fair practice, and 24.3% had poor practice. The mean total practice score was  $16.36 \pm 4.871$  (range 6 to 24). A key point is Item 1 (checkups without symptoms). Only 40.0% reported doing checkups often or always (25.6% often, 14.4% always), while 60.1% reported never or rarely (30.4% never, 29.7% rarely), with a mean of 2.24. This supports that preventive checkups were not a stable habit for many nurses when they had no symptoms.

This pattern also appears in other settings. In Delta State, Nigeria, health workers reported that the main reason for doing tests in the past year was illness (60.0%), while only 25.4% reported tests “as routine medical checkup”. In the same study, only 26.2% had a good practice score and 73.7% had a poor practice score. These findings show that checkup practice can still be weak, even among health workers (Abadam & Otene, 2022). Item 6 adds a clearer picture of timing. In this study, 31.0% had a checkup within the past year, and 27.2% had one in 1 to less than 2 years. Together, 58.2% had a checkup within the past 2 years. In contrast, 16.9% had never had a checkup, and 8.9% had one 5 years or more ago.

For context, studies in other countries show similar levels. In Malaysia, frequent practice in the past 12 months was found in 35.7% of healthcare professionals and 32.3% of nurses (Ahmed et al., 2025). In Addis Ababa, Ethiopia, 39.4% had a routine medical checkup in the past 12 months, and 67.8% had ever had a routine checkup (Getahun et al., 2023). In Calabar, Nigeria, only 46% practiced routine health checkup (Ojong et al., 2020). These figures show that routine checkup practice can remain moderate, even when knowledge and attitudes are positive.

The open-ended suggestions in Table 4 support the same message. The most common suggestion was an on-site regular check-up program in the hospital (32.6%). This was followed by protected time during duty hours with a clear schedule (17.9%) and free or low-cost tests (13.1%). These suggestions show practical needs in the work setting. Staff need easier access, less time away from duties, and clearer steps.

This striking prominence of discrepancy between the nursing staff's exceptionally high perceptual factors (overall mean = 4.38) and their only fair regular check-up practice (overall mean = 2.73) can be scientifically contextualized through the lens of the Intention-Behavior Gap within health behavior theories. Owing to their professional medical education and clinical training, nurses possess an acute cognitive awareness and strong positive beliefs regarding the clinical significance of early disease detection. However, this high internal motivation fails to translate into actual preventive practice due to formidable systemic constraints. The study's results heavily support this interpretation, as reflected in the remarkably low perceived support from the HCS (overall mean = 1.83). Heavy workloads, chronic understaffing, and exhausting shift schedules create severe time constraints. Concurrently, the lack of administrative incentives, organizational encouragement, and institutional wellness programs from hospital management further compound these barriers. Consequently, these structural and administrative obstacles act as decisive structural barriers that suppress the transition from high health perception to actual proactive health-seeking behavior.

Table 5 shows positive correlations between the study factors and regular check-up practice. Among HCS factors, the Organizational and Administrative factor displayed the most prominent and consistent link with practice, correlating with overall practice ( $Cc = 0.356$ ,  $p < 0.001$ ), self-initiated practice ( $Cc = 0.343$ ,  $p < 0.001$ ), and institutional compliance ( $Cc = 0.307$ ,  $p < 0.001$ ). While these highly significant p-values underscore the structural importance of administrative planning, the magnitude of the contingency coefficients reflects a realistic, context-specific effect size that typically characterizes multi-layered healthcare environments. This indicates that practice steadily improves when the hospital provides a structured ecosystem, such as fixed schedules, systematic reminders, and standardized documentation, though these operational pathways inherently interact with other broad systemic variables within the hospital. This aligns with evidence from Addis Ababa, where provider commitment was key to routine medical checkups (Getahun et al., 2023).

Similarly, the Accessibility and Follow-up factor correlated with overall practice ( $Cc = 0.204$ ,  $p < 0.001$ ), representing a modest yet stable institutional link, further supporting the importance of refining scheduling and reception processes within hospital diagnostic pathways to facilitate smoother employee utilization (Toniasso et al., 2022). In contrast, the Financial Support factor showed the most selective links, correlating with overall practice ( $Cc = 0.130$ ,  $p = 0.022$ ) and institutional compliance ( $Cc = 0.137$ ,  $p = 0.015$ ). These contextually grounded coefficients demonstrate that cost coverage acts as an essential baseline facilitator for hospital-organized screening events rather than an absolute, independent driver for personal health routines. This mirrors operational realities observed in Nigeria and Ethiopia, where cost was noted as a baseline institutional

barrier but not the sole determinant of proactive practice (Abadom & Otene, 2022; Getahun et al., 2023).

For perceptual factors, the overall perceptual score correlated with overall practice ( $Cc = 0.272$ ,  $p < 0.001$ ). The strongest links were for Perceived Barriers and Self-Efficacy ( $Cc = 0.224$ ,  $p < 0.001$ ) and Perceived Benefits and Cues to Action ( $Cc = 0.222$ ,  $p < 0.001$ ). Self-efficacy is also important in nursing staff in Kerbala. A local study measured self-efficacy and reported high levels (Ayoub & Faris, 2025). Perceived Severity and Susceptibility was the weakest ( $Cc = 0.119$ ,  $p = 0.036$ ). This suggests that practice is influenced more by feasibility and clear cues than by risk awareness alone. External evidence shows the same gap between positive views and routine action. In Malaysia, attitude was very high (99.4%) but frequent practice was only 35.7% (Ahmed et al., 2025). In Calabar, Nigeria, knowledge was high (92.8%) and attitude was positive for many (64.5%), yet practice was lower (46%) (Ojong et al., 2020).

Table 6 shows most sociodemographic characteristics were not significantly related to regular check-up practice among nurses. Only education level, workplace unit, and family history of chronic diseases showed significant differences. Age and sex were not significant, and this is close to what was reported in Malaysia (Ahmed et al., 2025). At the same time, it was not similar to the Nigerian study, where females showed better routine medical screening practice (Abadom & Otene, 2022). Marital status and monthly income were also not significant in this study, unlike findings from Ethiopia, where both were linked with greater use of routine medical check-ups, and unlike part of the Malaysian findings, where marital status was significant but income was not (Ahmed et al., 2025; Getahun et al., 2023). Education level may be related to practice because nurses with different qualifications may have different duties and different time available for personal check-ups. The same may apply to workplace unit, since workload and administrative support are not the same in all hospital units. A similar variation between staff groups was also reported in Nigeria (Ojong et al., 2020). Nurses with a family history of chronic diseases also showed better practice, which may be because they feel more concerned about their own health risk.

#### 4.1. Limitations of the Study

Several limitations should be considered within the scope of this study. The reliance on self-reported questionnaires may introduce social desirability bias regarding screening adherence, as participants might overreport practices to align with professional expectations. Additionally, heavy workloads and acute time constraints during duty shifts restricted the time available for some nurses, resulting in incomplete responses. To preserve strict data quality, all incomplete forms were rigorously excluded during the data-cleaning phase to ensure that the final analysis was based solely on verified, complete profiles. Furthermore, the cross-sectional design captures system support and nursing practices at a single point in time, which precludes establishing definitive causal relationships over the long term.

#### 5. Conclusions

1. HCS support for regular check-up practice among nursing staff was low.
2. The level of perceptual factors related to regular check-up practice among nursing staff was high.
3. Regular check-up practice among nursing staff was at a fair level.
4. Regular check-up practice was significantly associated with HCS support and perceptual factors.

5. Most sociodemographic and work-related characteristics were not significantly related to regular check-up practice.
6. Significant differences in regular check-up practice were observed according to education level, workplace unit, and family history of chronic diseases.

## 6. Recommendations

1. Greater institutional support is needed to encourage regular check-up practice among nursing staff.
2. Hospitals should establish an organized regular check-up program for nursing staff within the workplace.
3. Nurses' positive perceptions toward regular check-ups should be maintained through ongoing awareness and supportive educational activities.
4. The current level of regular check-up practice needs further improvement through practical measures within the workplace.
5. Future interventions should address both HCS factors and perceptual factors that may influence regular check-up practice.

## 7. Acknowledgement

The researcher would like to express sincere gratitude to the University of Kerbala, College of Nursing, for its support and ethical approval. The researcher also thanks the Kerbala Health Directorate and the administrations of Imam Al-Hussein Medical City, Kerbala Teaching Hospital for Children, and the Maternity and Gynecology Teaching Hospital for facilitating access and data collection. Special thanks are extended to the nursing staff who participated in this study for their time and cooperation.

## 8. References

- Abadom, E. G., & Otene, C. I. (2022). Factors affecting routine medical screening among health workers in a tertiary hospital in Delta State. *Nigerian Journal of Clinical Practice*, 25(6), 951–959.
- Abed-Al Sattar, M. E., Thamer, M. S., & Gatea, A. G. (2023). Health workers' adherence to occupational hazards preventive practices in Thi-Qar Governorate, Iraq. *Journal of Public Health in Africa*, 14(10), 2788.
- Ahmed, F. M., Aizuddin, A. N., & Ahmad, N. (2025). Knowledge, Attitudes, and Practices of Periodic Medical Examinations Among Healthcare Professionals in a Tertiary Care Hospital in Malaysia. *Cureus*, 17(7), e87459. <https://doi.org/10.7759/cureus.87459>
- Ali, K. A. S., & Fateh, S. M. (2022). Mammographic breast density status in women aged more than 40 years in Sulaimaniyah, Iraq: a cross-sectional study. *Journal of International Medical Research*, 50(12). <https://doi.org/10.1177/03000605221139712>
- Alkhaqani, A. L. (2023). Future Challenges for Nursing: An Overview. *Al-Ameed Journal for Medical Research and Health Sciences*, 1(1), 2. <https://doi.org/10.61631/3005-3188.1001>
- Almufty, H. B., Abdulrahman, I. S., & Merza, M. A. (2019). Latent tuberculosis infection among healthcare workers in Duhok province: From screening to prophylactic treatment. *Tropical Medicine and Infectious Disease*, 4(2), 1–11. <https://doi.org/10.3390/tropicalmed4020085>

- Alshamlan, N. A., Alomar, R. S., Alabdulkader, A. M., Alghamdi, F. A., Aldakheel, A. A., Al Shehri, S. A., Felemban, L. A., Shafey, M. M., & Al Shammari, M. A. (2023). Beliefs and Utilization of Cervical Cancer Screening by Female Health Care Workers in Saudi Arabia Using the Health Belief Model: A Nationwide Study. *International Journal of Women's Health, 15*, 1245–1259. <https://doi.org/10.2147/IJWH.S415924>
- Alyafei, A., & Easton-Carr, R. (2024). The health belief model of behavior change. *StatPearls*.
- Araujo, G. C., Ribeiro, C. B., Costa, M. C. M., Evangelista, M. L. P., Lima, M. F., De Paula, M. C., Ferreira, V. L., Araujo, F. A. G. da R., Ribeiro, C., & Costa Sr, M. C. (2025). Evidence-Based Periodic Health Examinations for Adults: A Practical Guide. *Cureus, 17*(3).
- Ayoub, A. B., & Faris, S. H. (2025). The Effect of Growth Mindset on Self Efficacy Among Nursing Staff. *Kerbala Journal of Nursing and Health Sciences.*, 1(2), 81–97. <https://journals.uokerbala.edu.iq/index.php/kjnhs/article/view/4851>
- Aytenew, T. M., Kassie, Y. T., & Kebede, S. D. (2024). Uptake of Cervical Cancer Screening and Its Barriers Using Health Belief Model Among Health Professionals Working in Public Hospitals in South Gondar Zone, Northcentral Ethiopia: Multicenter Cross-Sectional Study. *Women's Health Reports (New Rochelle, N.Y.)*, 5(1), 152–160. <https://doi.org/10.1089/whr.2023.0030>
- Bleier, H., Lützerath, J., & Schaller, A. (2023). Organizational facilitators and barriers for participation in workplace health promotion in healthcare: A qualitative interview study among nurses. *Frontiers in Psychology, 14*, 1101235.
- Clark, M. J. (2015). Population and Community Health. In *Leading Health Care Transformation*. <https://doi.org/10.4324/9781003402831-14>
- Denge, T., & Rakhudu, M. (2022). Perceptions of nurses on occupational health hazards and safety practices in Ditsobotla public hospitals in North West province. *Curationis, 45*(1), 1–9. <https://doi.org/10.4102/curationis.v45i1.2220>
- Ellis, L. A., Tran, Y., Pomare, C., Long, J. C., Churruca, K., Saba, M., & Braithwaite, J. (2023). Hospital organizational change: The importance of teamwork culture, communication, and change readiness. *Frontiers in Public Health, 11*. <https://doi.org/10.3389/fpubh.2023.1089252>
- Fadil, M. M., & Oleiwi, S. S. (2025). *The Role of Health Motivation in Enhancing Adherence to Cervical Cancer Screening Among Female Staff at the University of Kerbala*. 9047, 28–39.
- Getahun, G. K., Arega, M., Keleb, G., Shiferaw, A., & Bezabih, D. (2023). Assessment of routine medical checkups for common noncommunicable diseases and associated factors among healthcare professionals in Addis Ababa, Ethiopia, in 2022 a cross-sectional study. *Annals of Medicine and Surgery, 85*(5), 1633–1641. <https://doi.org/10.1097/MS9.0000000000000558>
- Jang, S. H. (2022). Social-ecological factors related to preventive behaviors during the COVID-19 pandemic in South Korea. *PLOS ONE, 17*(3), e0266264. <https://doi.org/10.1371/journal.pone.0266264>
- Khaleel, B. B., Saadi, F. S., Shahab, F. I., & Saeed, S. Y. (2024). Screening for Diabetes Mellitus and Hypertension in Duhok Governorate, Kurdistan Region of Iraq. *Journal of Contemporary Medical Sciences, 10*(4), 303–308. <https://doi.org/10.22317/jcms.v10i4.1598>
- Lefta, R. M., Omran, T. Z., Faris, S. H., & Al-Araji, A. E. (2021). Effects of knowledge, attitude and safety measures on infection control among health care providers at hemodialysis unit in Iraq. *Latin American Journal of Pharmacy, 40*(Special Issue), 325–331.

- Lukewich, J., Martin-Misener, R., Norful, A. A., Poitras, M.-E., Bryant-Lukosius, D., Asghari, S., Marshall, E. G., Mathews, M., Swab, M., & Ryan, D. (2022). Effectiveness of registered nurses on patient outcomes in primary care: a systematic review. *BMC Health Services Research*, 22(1), 740.
- Marevesa, R., & Mhlanga, M. (2024). Factors associated with utilisation of staff clinic services by nurses at Parirenyatwa Group of Hospitals, Zimbabwe. A cross-sectional study. *Nsc Nursing*, 2(2), 24–46. <https://doi.org/10.32549/opi-nsc-104>
- Nyaaba, J. A., & Akurugu, E. (2023). Knowledge, barriers and uptake towards Cervical Cancer screening among female health workers in Ghana: A perspective of the Health Belief Model. *International Journal of Africa Nursing Sciences*, 19(March), 100587. <https://doi.org/10.1016/j.ijans.2023.100587>
- Ojong, I. N., Nsemo, A. D., & Aji, P. (2020). Routine Medical Checkup Knowledge, Attitude and Practice among Health Care Workers in a Tertiary Health Facility in Calabar, Cross River State, Nigeria. *Global Journal of Health Science*, 12(8), 27. <https://doi.org/10.5539/gjhs.v12n8p27>
- Organization, W. H. (2020). Screening Programmes: A short guide. *WHO Press*, 1, 1–70. <https://apps.who.int/iris/bitstream/handle/10665/330829/9789289054782-eng.pdf>
- Pender, N. J., Murdaugh, C. L., & Parsons, M. A. (2015). *Health Promotion in Nursing Practice* (7th ed.). Pearson Education. <https://www.minams.edu.pk/cPanel/ebooks/H.A/Health>
- Sabri Shamkh, S., Hashim Mohammed, A., & Abdulhussein Al-Abedi, G. (2022). Occupational Hazards among Nurses at Primary Health Care Centers in Al-Amara City/ Iraq. *Bahrain Medical Bulletin*, 44(1), 846–850.
- Salih Mahdi, Z., & Faris, S. H. (2024). Kufa Journal for Nursing Sciences The Link between Workplace Safety Climate and Job Performance among Nursing Staff: A Correlational Study. *Kufa Journal for Nursing Sciences*, 14(2), 95–103. <https://doi.org/10.36321/kjns.vi20242.16611>
- Taher, T. M. J., Saadi, R. B., & Sarray, F. T. R. (2023). Health Belief Model Attitudes of Iraqi Women Towards Breast Cancer and Its Early Detection Methods. *Ethiopian Journal of Reproductive Health*, 15(1), 17–25. <https://doi.org/10.69614/ejrh.v15i1.642>
- Tayoun, A. A. (2025). Determinants of Periodic Health Examination Uptake: Insights From a Jordanian Cross-Sectional Study. *JMIRx Med*, 6, e57597–e57597. <https://doi.org/10.2196/57597>
- Toniasso, S. de C. C., Brum, M. C. B., Hirakata, V. N., & Schlatter, R. P. (2022). Quality management of the periodic medical examination at a university hospital, from the workers' perspective. *Revista Brasileira de Medicina Do Trabalho*, 20(2), 222–230. <https://doi.org/10.47626/1679-4435-2022-646>
- Virtanen, M., Lallukka, T., Elovainio, M., Steptoe, A., & Kivimäki, M. (2025). Effectiveness of workplace interventions for health promotion. *The Lancet Public Health*, 10(6), e512–e530. [https://doi.org/10.1016/S2468-2667\(25\)00095-7](https://doi.org/10.1016/S2468-2667(25)00095-7)
- West, R., & Michie, S. (2021). A Brief Introduction to the COM-B Model of Behaviour and the PRIME Theory of Motivation. *Qeios*, 3(5), 1–7. <https://doi.org/10.32388/ww04e6.3>
- WHA. (2017). *Workplace Health in America Survey Instrument*. 1–29.
- WHO. (2022). Occupational health: health workers. In *World Health Organization (WHO)*. <https://www.who.int/news-room/fact-sheets/detail/occupational-health-health-workers>

- World Health Organization. (2025). Health promotion and disease prevention through population-based interventions, including action to address social determinants and health inequity. In *World Health Organization*. <https://www.emro.who.int/about-who/public-health-functions/health-promotion-disease-prevention.html>
- Yeşilgöz, P., & Arga, K. Y. (2025). A Health-Sector-Specific Occupational Health and Safety Management System Model. *Healthcare (Switzerland)*, *13*(3), 1–16. <https://doi.org/10.3390/healthcare13030271>