# Multi-level analysis of Health Management Information System (HMIS) adoption by healthcare professionals in the ESIC main hospital and dispensaries in the Tirunelveli sub-region in Tamil Nadu, India

Sriram C. [1] & Pichaandy C. [2]

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## ABSTRACT

This study aims to analyse the unique contribution of individual factors on HMIS adoption among healthcare professionals in ESIC healthcare settings, as well as possible interrelations between these factors.. A simple random sampling method was used to select 171 healthcare professionals in the ESIC main hospital and dispensaries in the Tirunelveli sub-region. One-way ANOVA and Post-Hoc test were applied to identify the individual determinants of HMIS adoption in ESIC clinical settings. This study will assess the contribution of individual factors, as well as their interactions, to the implementation of HMIS in ESIC clinical settings. The analysis provides a set of key results making it possible to understand the challenges and opportunities for HMIS adoption by healthcare professionals.

**Keywords:** Health Management Information System, One-way ANOVA, Post-Hoc test, Adoption and Clinical settings.

[1] Assistant Professor, P.G. Department of Journalism and Communication, Dwaraka Doss Goverdhan Doss Vaishnav College, Chennai, Tamil Nadu, India, email: srirammediaguy@gmail.com

[2]Emeritus Professor, PSG College of Arts and Science, Coimbatore, Tamil Nadu, India, email: cpichaandy@yahoo.co.in

## INTRODUCTION

Information and Communication Technologies (ICTs) include a set of effective tools to collect, store, process, and exchange health-related information. ICT could also improve safety, quality, and cost-efficiency of services in the healthcare environment.

IT in health sector could be used for better diagnosis, better training and sharing of knowledge and improving communication (Kalpa, 2012). The scope of public health informatics is immense and it requires the application of knowledge from numerous disciplines, particularly information science, computer science, management, organizational theory, psychology, communications, political science, and law. Policy, standards or guidelines had to be formulated to maintain quality in health information system. Constant flow of funds from the government could result in availability and improvement of current infrastructure, purchasing and installation of latest technology, recruitment of competent staff or train existing health staff. Public private partnership should be encouraged to expand the utilization of health information technology.

Among the applications of ICTs to the healthcare sector, the Health Management Information System (HMIS) is viewed as the backbone supporting the integration of various tools like emergency information, test ordering, electronic prescription, decision support systems, digital imagery, and telemedicine that could improve the uptake of services into clinical decisions. Using such a technology in daily clinical practices could enable a safer and more efficient healthcare system. Patients, professionals, organisations, and the public in general are thus expected to benefit from HMIS implementation.

Although information and communication technology are now part of the everyday life of most human beings, the use of HMIS software to provide health information and care in the ESIC healthcare environment is particularly challenging in Tirunelveli, sub-region in Tamil Nadu, India and calls for specific strategies. The aim of this paper is to analyse the factors that could facilitate healthcare provider utilization of HMIS in their work.

## LITERATURE REVIEW

Digitization saves a lot of time in record keeping and report generation. The initial capital costs of digitization could be fully recovered within two years of implementation. Such a scenario could be achieved only if the available system is fully operational (Krishnan, Nongkynrih, Yadav, Singh, & Gupta, 2010). Further, digitization can also improve the service delivery, planning, monitoring and supervision activities. Therefore, in the near future, digitization aims to contribute in the convergence of different services related to health services.

IT stress is said to be an important factor and its evaluation techniques are based on the widely used Technology Acceptance Model (TAM). IT stress could be broadly classified into two types: There is Direct IT stress and Indirect IT stress (Raitoharju, 2005). Direct IT stress is a hindrance and caused by the following factors: person's fear of breaking something, feeling of ignorance, fear of technology, fear about health, and fear about anything new and unfamiliar or sense of threat to intellectual self-assessment. Indirect stress is about time consumption and pressure. Here, the user is an expert in information technology and spends a lot of time in IT related works. Since he spends a lot of time in front of computers, he is unable to complete other tasks properly. This creates unwanted pressure and such pressure gives wayto indirect IT stress. Further, computer anxiety reduces the effectiveness of computerization. Perceived usefulness and Perceived ease of use play an important role in IT acceptance studies. Perceived usefulness encouraged IT usage and thereby results in technology acceptance. However, Perceived ease of use does not have any significant effect on Perceived usefulness.

The quality of data plays an all important role in setting up global standards. Firstly, the standards should be locally assigned and then there should be sound network facilities to support the local adaptation of standards. The health system of an entire country could be addressed through standardization. Such standardization should take place at the data production and collection levels (Jacucci, Shaw, & Braa, 2006). The set of essential data and its hierarchy constitutes the standard. Once the standard was implemented, the data quality in the entire system should be guaranteed to ensure its sustainability. The available data should be used at the level of collection and only then "local" sustainability of a local system could be a reality. Global standard-based health Information system in developing countries relies

heavily on the 'sustainability' factor. Local use, local capacity building and local appropriation of the standard should also be taken into account while planning a sustainable information system. In a sustainable information environment, the responsibilities should reach the bottom of the hierarchy and only then standards could be proactively reinvented.

Adoption of electronic health records (EHRs) is progressing slowly. A stratified random sample of medical group practices is used in the study. Group practices are defined as three or more physicians practicing together with a common billing and medical record system. The main aim of the study is to assess the information technology usage of the medical practitioners. A five-point likert scale has been used to rate the benefits of electronic health records. It is found that electronic health records improved the access to medical record information. Further, they improve the workflow in medical practice and also brought about improved patient care (Gans, Kralewski, Hammons, & Dowd, 2005). The transition from computer-based administrative information systems to fully implemented EHRs has always been more complicated, more difficult, and more expensive. However, EHRs has numerous advantages and it promises to improve practice efficiency, quality, and service.

The telemedicine referrals were used as a second opinion advice tool. Technology helped a lot in assisting the patients and updating medical knowledge. The staff members were told about the available technology. Further, training and equipment were also provided. But the main problem was that staff was unable to put the technology into real practice (Shiferaw & Zolfo, 2012). Telemedicine referrals brought about a lot of awareness at the community level and also at the level of officials. Ambiguity always existed regarding the functioning and ownership of the projects. Such unclearness had a negative impact on the adoption, resource allocation and proper monitoring and evaluation of the health projects.

Security and patients' medical data formed an integral part of the electronic health records management system. Flexibility, modularity and scalability were found to be the important performance factors in electronic health records management systems (Končar & Lončarić, 2003). Unauthorized access of the patients' medical data from both outside and inside local hospital network should be prevented. Further, demand of legal patients' ownership of their own medical data should also be taken into consideration in a secured health information management system.

Paediatricians' decisions were not influenced by peer pressure. Attitudes of physicians played a prime role in adoption of technology (Chismar & Patton, 2002). Besides Technology

Acceptance Model (TAM), there was another model called the Extended Technology Acceptance Model (TAM2). In TAM2, two additional theoretical constructs were added. They were cognitive instrumental processes and social influence processes. These days, the paediatricians widely used the internet and hence, the Internet and Internet-based health applications (IHA) was also taken into account. It was found out that perceived usefulness had a significant effect on intention to use and perceived ease of use. The perceived usefulness was found to have a significant and strong influence on physicians' usage intention. However, the perceived ease of use was not found to be significant. As perceived ease of use factor weakened, the competency of the user got increased. All these results partially supported the TAM2 model. Further, the paediatricians were willing to use the internet only when it was found to be beneficial in their daily tasks.

The sustainability of Health Information System depended on the technical features and physical infrastructures. Any lack of technical approach would lead to instability of the information system. Socio-technical aspects played an important role in information system. Integration of such aspects into the organizational structures would lead to stability (Kimaro & Nhampossab, 2007). They would also enable easy execution of routine activities. Health services mainly included curative and preventive activities. These activities were hampered by scarce resources. The main aim of HIS was to overcome the scarcity and bring about better care. Further, extra attention should be given to users' needs, evaluation and feedback generation and future improvements. Information generation and sharing of knowledge within the sustainability strategy framework would also add to the stability of health systems.

Integration refers to the degree of interoperability and interconnectivity among technical components, and relies on standardization at a certain level. A certain degree of flexibility and a minimum level of symmetry may be necessary conditions for integration of systems to succeed (Sahay, Monteiro, & Aanestad, 2007). Technical and political symmetry are found to be the key components of an integration solution and furthermore, integration totally depends on adaptability and flexibility.

## METHODOLOGY

Quantitative adoption study was applied by use of questionnaires on healthcare professionals in ESIC main hospital and dispensaries at Tirunelveli sub-region. The selected districts in Tirunelveli sub-region in Tamil Nadu include Tirunelveli, Tuticorin and Kanyakumari districts. The models that have been used to understand adoption behaviors with respect to HMIS among ESIC healthcare professionals are Technology Acceptance Model (TAM) and Revised Technology Acceptance Model. In order to carry out a multi-level analysis of HMIS adoption among healthcare professionals at the ESIC main hospital and dispensaries in Tirunelveli sub-region, 171 healthcare professionals were chosen through random sampling. The participants for the study were doctors, staff nurses, nursing assistants, lab technicians, pharmacists, administration officers and IT officers. Survey questionnaire was distributed to the ESIC healthcare professionals to collect their responses regarding the adoption of Health Management Information System (HMIS). Appropriate statistical tools were used to test the hypothesis and the statistical tools used in this study were One-way ANOVA and Post Hoc test.

## DATA AND ANALYSIS

**$H_0$5:** There is no significant difference among administration officers, technicians, pharmacists, nursing assistants, staff nurses and doctors in adopting health management information system working in ESIC hospital and dispensaries.

**TABLE 4.17**

**TABLE OF MEANS FOR THE CONSTRUCTS AND RESPONDENTS' OCCUPATION**

| | | Designation | | | | | |
|---|---|---|---|---|---|---|---|
| | | Doctor | Staff Nurse | Nurse Assistant | Technician | Pharmacist | Administration officer |
| System Quality | Mean | 23.79 | 23.33 | 22.75 | 19.67 | 22.10 | 14.45 |
| | SD | (4.21) | (3.94) | (5.12) | (4.01) | (4.54) | (3.98) |
| Computer Self-Efficacy | Mean | 22.76 | 24.29 | 23.61 | 17.72 | 23.53 | 13.09 |
| | SD | (5.27) | (4.73) | (6.33) | (4.76) | (6.61) | (3.67) |
| Facilitating Conditions | Mean | 33.17 | 34.05 | 34.64 | 27.39 | 32.70 | 18.64 |
| | SD | (5.59) | (5.76) | (5.47) | (8.98) | (7.43) | (5.16) |
| Perceived Usefulness | Mean | 33.14 | 32.45 | 30.36 | 25.61 | 31.27 | 21.45 |
| | SD | (6.37) | (5.89) | (7.20) | (6.93) | (6.21) | (6.20) |
| Perceived Ease of Use | Mean | 13.57 | 14.24 | 14.32 | 12.17 | 13.33 | 8.91 |
| | SD | (3.35) | (2.76) | (3.12) | (3.79) | (3.35) | (1.30) |
| Perceived Behavioral Control | Mean | 36.71 | 38.38 | 36.82 | 31.78 | 35.00 | 20.82 |
| | SD | (7.49) | (5.75) | (6.35) | (7.67) | (8.66) | (5.83) |
| Attitude | Mean | 27.62 | 29.57 | 27.39 | 23.61 | 27.53 | 18.00 |
| | SD | (6.59) | (6.80) | (7.69) | (7.54) | (7.73) | (3.85) |
| Subjective Norm | Mean | 15.00 | 15.45 | 14.68 | 12.28 | 14.83 | 9.91 |
| | SD | (3.27) | (3.47) | (3.35) | (4.47) | (3.22) | (1.38) |
| Behavioral Intention | Mean | 14.33 | 14.50 | 13.82 | 12.28 | 14.50 | 8.45 |
| | SD | (3.82) | (3.56) | (3.93) | (5.07) | (4.21) | (2.91) |

**TABLE 4.18**

**RESULTS OF ONE-WAY ANOVA FOR RESPONDENTS' OCCUPATION (HEALTHCARE PROFESSIONALS) AND HMIS ADOPTION FACTORS**

| Adoption factors | Source of variation | df (2, 168) | | 'F' value | 'p' value |
|---|---|---|---|---|---|
| | | Sum of squares | Mean square | | |
| System Quality | Between | 943.655 | 188.731 | 10.048 | 0.000** |
| | Within | 3099.082 | 18.782 | | |
| Computer Self-Efficacy | Between | 1577.822 | 315.564 | 10.577 | 0.000** |
| | Within | 4922.856 | 29.835 | | |
| Facilitating Conditions | Between | 2790.710 | 558.142 | 13.763 | 0.000** |
| | Within | 6691.290 | 40.553 | | |
| Perceived Usefulness | Between | 1798.392 | 359.678 | 8.724 | 0.000** |
| | Within | 6802.848 | 41.229 | | |
| Perceived Ease of Use | Between | 303.702 | 60.740 | 6.186 | 0.000** |
| | Within | 1620.088 | 9.819 | | |
| Perceived Behavioral Control | Between | 3080.459 | 616.092 | 12.302 | 0.000** |
| | Within | 8263.331 | 50.081 | | |
| Attitude | Between | 1404.381 | 280.876 | 5.706 | 0.000** |
| | Within | 8122.613 | 49.228 | | |
| Subjective Norm | Between | 372.322 | 74.464 | 6.497 | 0.000** |
| | Within | 1891.199 | 11.462 | | |
| Behavioral Intention | Between | 402.303 | 80.461 | 5.162 | 0.000** |
| | Within | 2571.779 | 15.587 | | |

Note : 1. ** denotes significant at 1% level

**(At 5% level of significance for (2,168) df the table value of 'F' is 3.04)**

Since P value is less than 0.01, the null hypothesis is rejected at 1% level with regard to dimensions of system quality, computer self-efficacy, facilitating conditions, perceived usefulness, perceived ease of use, perceived behavioral control, attitude, subjective norm and behavioral intention. There is significant difference among administration officers, technicians, pharmacists, nursing assistants, staff nurses and doctors working in ESIC hospital and dispensaries in Tirunelveli sub-region in their system quality, computer self-efficacy, facilitating conditions, perceived usefulness, perceived ease of use, perceived behavioral control, attitude, subjective norm and behavioral intention.

**TABLE 4.19**

**RESULTS OF POST-HOC TEST FOR RESPONDENTS' OCCUPATION (HEALTHCARE PROFESSIONALS) AND HMIS ADOPTION FACTORS**

| Adoption factors | Designation | | Mean Difference | Sig. |
|---|---|---|---|---|
| System Quality | Doctor | Staff Nurse | .452 | .997 |
| | | Nurse Assistant | 1.036 | .924 |
| | | Technician | **4.119*** | .012 |
| | | Pharmacist | 1.686 | .582 |
| | | Administration officer | **9.331*** | .000 |
| | Staff Nurse | Doctor | -.452 | .997 |
| | | Nurse Assistant | .583 | .994 |
| | | Technician | **3.667*** | .036 |
| | | Pharmacist | 1.233 | .841 |
| | | Administration officer | **8.879*** | .000 |
| | Nurse Assistant | Doctor | -1.036 | .924 |
| | | Staff Nurse | -.583 | .994 |
| | | Technician | 3.083 | .179 |
| | | Pharmacist | .650 | .993 |
| | | Administration officer | **8.295*** | .000 |
| | Technician | Doctor | **-4.119*** | .012 |
| | | Staff Nurse | **-3.667*** | .036 |
| | | Nurse Assistant | -3.083 | .179 |
| | | Pharmacist | -2.433 | .416 |
| | | Administration officer | **5.212*** | .024 |
| | Pharmacist | Doctor | -1.686 | .582 |
| | | Staff Nurse | -1.233 | .841 |
| | | Nurse Assistant | -.650 | .993 |
| | | Technician | 2.433 | .416 |
| | | Administration officer | **7.645*** | .000 |
| | Administration officer | Doctor | **-9.331*** | .000 |
| | | Staff Nurse | **-8.879*** | .000 |
| | | Nurse Assistant | **-8.295*** | .000 |
| | | Technician | **-5.212*** | .024 |
| | | Pharmacist | **-7.645*** | .000 |

**Cont.,**

| **Adoption factors** | **Designation** | | **Mean Difference** | **Sig.** |
|---|---|---|---|---|
| Computer Self-Efficacy | Doctor | Staff Nurse | -1.524 | .796 |
| | | Nurse Assistant | -.845 | .988 |
| | | Technician | **5.040*** | .016 |
| | | Pharmacist | -.771 | .992 |
| | | Administration officer | **9.671*** | .000 |
| | Staff Nurse | Doctor | 1.524 | .796 |
| | | Nurse Assistant | .679 | .996 |
| | | Technician | **6.563*** | .000 |
| | | Pharmacist | .752 | .992 |
| | | Administration officer | **11.195*** | .000 |
| | Nurse Assistant | Doctor | .845 | .988 |
| | | Staff Nurse | -.679 | .996 |
| | | Technician | **5.885*** | .006 |
| | | Pharmacist | .074 | 1.000 |
| | | Administration officer | **10.516*** | .000 |
| | Technician | Doctor | **-5.040*** | .016 |
| | | Staff Nurse | **-6.563*** | .000 |
| | | Nurse Assistant | **-5.885*** | .006 |
| | | Pharmacist | **-5.811*** | .006 |
| | | Administration officer | 4.631 | .236 |
| | Pharmacist | Doctor | .771 | .992 |
| | | Staff Nurse | -.752 | .992 |
| | | Nurse Assistant | -.074 | 1.000 |
| | | Technician | **5.811*** | .006 |
| | | Administration officer | **10.442*** | .000 |
| | Administration officer | Doctor | **-9.671*** | .000 |
| | | Staff Nurse | **-11.195*** | .000 |
| | | Nurse Assistant | **-10.516*** | .000 |
| | | Technician | -4.631 | .236 |
| | | Pharmacist | **-10.442*** | .000 |

**Cont.,**

| **Adoption factors** | **Designation** | | **Mean Difference** | **Sig.** |
|---|---|---|---|---|
| Facilitating Conditions | Doctor | Staff Nurse | -.881 | .988 |
| | | Nurse Assistant | -1.476 | .933 |
| | | Technician | **5.778*** | .019 |
| | | Pharmacist | .467 | 1.000 |
| | | Administration officer | **14.530*** | .000 |
| | Staff Nurse | Doctor | .881 | .988 |
| | | Nurse Assistant | -.595 | .999 |
| | | Technician | **6.659*** | .004 |
| | | Pharmacist | 1.348 | .950 |
| | | Administration officer | **15.411*** | .000 |
| | Nurse Assistant | Doctor | 1.476 | .933 |
| | | Staff Nurse | .595 | .999 |
| | | Technician | **7.254*** | .003 |
| | | Pharmacist | 1.943 | .855 |
| | | Administration officer | **16.006*** | .000 |
| | Technician | Doctor | **-5.778*** | .019 |
| | | Staff Nurse | **-6.659*** | .004 |
| | | Nurse Assistant | **-7.254*** | .003 |
| | | Pharmacist | -5.311 | .063 |
| | | Administration officer | **8.753*** | .006 |
| | Pharmacist | Doctor | -.467 | 1.000 |
| | | Staff Nurse | -1.348 | .950 |
| | | Nurse Assistant | -1.943 | .855 |
| | | Technician | 5.311 | .063 |
| | | Administration officer | **14.064*** | .000 |
| | Administration officer | Doctor | **-14.530*** | .000 |
| | | Staff Nurse | **-15.411*** | .000 |
| | | Nurse Assistant | **-16.006*** | .000 |
| | | Technician | **-8.753*** | .006 |
| | | Pharmacist | **-14.064*** | .000 |

**Cont.,**

| **Adoption factors** | **Designation** | | **Mean Difference** | **Sig.** |
|---|---|---|---|---|
| Perceived Usefulness | Doctor | Staff Nurse | .690 | .996 |
| | | Nurse Assistant | 2.786 | .483 |
| | | Technician | **7.532*** | .001 |
| | | Pharmacist | 1.876 | .825 |
| | | Administration officer | **11.688*** | .000 |
| | Staff Nurse | Doctor | -.690 | .996 |
| | | Nurse Assistant | 2.095 | .764 |
| | | Technician | **6.841*** | .003 |
| | | Pharmacist | 1.186 | .972 |
| | | Administration officer | **10.998*** | .000 |
| | Nurse Assistant | Doctor | -2.786 | .483 |
| | | Staff Nurse | -2.095 | .764 |
| | | Technician | 4.746 | .147 |
| | | Pharmacist | -.910 | .994 |
| | | Administration officer | **8.903*** | .002 |
| | Technician | Doctor | **-7.532*** | .001 |
| | | Staff Nurse | **-6.841*** | .003 |
| | | Nurse Assistant | -4.746 | .147 |
| | | Pharmacist | **-5.656*** | .041 |
| | | Administration officer | 4.157 | .539 |
| | Pharmacist | Doctor | -1.876 | .825 |
| | | Staff Nurse | -1.186 | .972 |
| | | Nurse Assistant | .910 | .994 |
| | | Technician | **5.656*** | .041 |
| | | Administration officer | **9.812*** | .000 |
| | Administration officer | Doctor | **-11.688*** | .000 |
| | | Staff Nurse | **-10.998*** | .000 |
| | | Nurse Assistant | **-8.903*** | .002 |
| | | Technician | -4.157 | .539 |
| | | Pharmacist | **-9.812*** | .000 |

**Cont.,**

| **Adoption factors** | **Designation** | | **Mean Difference** | **Sig.** |
|---|---|---|---|---|
| Perceived Ease of Use | Doctor | Staff Nurse | -.667 | .925 |
| | | Nurse Assistant | -.750 | .923 |
| | | Technician | 1.405 | .605 |
| | | Pharmacist | .238 | 1.000 |
| | | Administration officer | **4.662*** | .000 |
| | Staff Nurse | Doctor | .667 | .925 |
| | | Nurse Assistant | -.083 | 1.000 |
| | | Technician | 2.071 | .182 |
| | | Pharmacist | .905 | .833 |
| | | Administration officer | **5.329*** | .000 |
| | Nurse Assistant | Doctor | .750 | .923 |
| | | Staff Nurse | .083 | 1.000 |
| | | Technician | 2.155 | .210 |
| | | Pharmacist | .988 | .836 |
| | | Administration officer | **5.412*** | .000 |
| | Technician | Doctor | -1.405 | .605 |
| | | Staff Nurse | -2.071 | .182 |
| | | Nurse Assistant | -2.155 | .210 |
| | | Pharmacist | -1.167 | .812 |
| | | Administration officer | 3.258 | .077 |
| | Pharmacist | Doctor | -.238 | 1.000 |
| | | Staff Nurse | -.905 | .833 |
| | | Nurse Assistant | -.988 | .836 |
| | | Technician | 1.167 | .812 |
| | | Administration officer | **4.424*** | .001 |
| | Administration officer | Doctor | **-4.662*** | .000 |
| | | Staff Nurse | **-5.329*** | .000 |
| | | Nurse Assistant | **-5.412*** | .000 |
| | | Technician | -3.258 | .077 |
| | | Pharmacist | **-4.424*** | .001 |

**Cont.,**

| **Adoption factors** | **Designation** | | **Mean Difference** | **Sig.** |
|---|---|---|---|---|
| Perceived Behavioral Control | Doctor | Staff Nurse | -1.667 | .889 |
| | | Nurse Assistant | -.107 | 1.000 |
| | | Technician | 4.937 | .137 |
| | | Pharmacist | 1.714 | .913 |
| | | Administration officer | **15.896*** | .000 |
| | Staff Nurse | Doctor | 1.667 | .889 |
| | | Nurse Assistant | 1.560 | .945 |
| | | Technician | **6.603*** | .014 |
| | | Pharmacist | 3.381 | .348 |
| | | Administration officer | **17.563*** | .000 |
| | Nurse Assistant | Doctor | .107 | 1.000 |
| | | Staff Nurse | -1.560 | .945 |
| | | Technician | 5.044 | .177 |
| | | Pharmacist | 1.821 | .924 |
| | | Administration officer | **16.003*** | .000 |
| | Technician | Doctor | -4.937 | .137 |
| | | Staff Nurse | **-6.603*** | .014 |
| | | Nurse Assistant | -5.044 | .177 |
| | | Pharmacist | -3.222 | .647 |
| | | Administration officer | **10.960*** | .001 |
| | Pharmacist | Doctor | -1.714 | .913 |
| | | Staff Nurse | -3.381 | .348 |
| | | Nurse Assistant | -1.821 | .924 |
| | | Technician | 3.222 | .647 |
| | | Administration officer | **14.182*** | .000 |
| | Administration officer | Doctor | **-15.896*** | .000 |
| | | Staff Nurse | **-17.563*** | .000 |
| | | Nurse Assistant | **-16.003*** | .000 |
| | | Technician | **-10.960*** | .001 |
| | | Pharmacist | **-14.182*** | .000 |

**Cont.,**

| **Adoption factors** | **Designation** | | **Mean Difference** | **Sig.** |
|---|---|---|---|---|
| Attitude | Doctor | Staff Nurse | -1.952 | .798 |
| | | Nurse Assistant | .226 | 1.000 |
| | | Technician | 4.008 | .331 |
| | | Pharmacist | .086 | 1.000 |
| | | Administration officer | **9.619*** | .001 |
| | Staff Nurse | Doctor | 1.952 | .798 |
| | | Nurse Assistant | 2.179 | .799 |
| | | Technician | **5.960*** | .035 |
| | | Pharmacist | 2.038 | .829 |
| | | Administration officer | **11.571*** | .000 |
| | Nurse Assistant | Doctor | -.226 | 1.000 |
| | | Staff Nurse | -2.179 | .799 |
| | | Technician | 3.782 | .479 |
| | | Pharmacist | -.140 | 1.000 |
| | | Administration officer | **9.393*** | .003 |
| | Technician | Doctor | -4.008 | .331 |
| | | Staff Nurse | **-5.960*** | .035 |
| | | Nurse Assistant | -3.782 | .479 |
| | | Pharmacist | -3.922 | .421 |
| | | Administration officer | 5.611 | .298 |
| | Pharmacist | Doctor | -.086 | 1.000 |
| | | Staff Nurse | -2.038 | .829 |
| | | Nurse Assistant | .140 | 1.000 |
| | | Technician | 3.922 | .421 |
| | | Administration officer | **9.533*** | .002 |
| | Administration officer | Doctor | **-9.619*** | .001 |
| | | Staff Nurse | **-11.571*** | .000 |
| | | Nurse Assistant | **-9.393*** | .003 |
| | | Technician | -5.611 | .298 |
| | | Pharmacist | **-9.533*** | .002 |

**Cont.,**

| **Adoption factors** | **Designation** | | **Mean Difference** | **Sig.** |
|---|---|---|---|---|
| Subjective Norm | Doctor | Staff Nurse | -.452 | .990 |
| | | Nurse Assistant | .321 | .999 |
| | | Technician | 2.722 | .054 |
| | | Pharmacist | .167 | 1.000 |
| | | Administration officer | **5.091*** | .000 |
| | Staff Nurse | Doctor | .452 | .990 |
| | | Nurse Assistant | .774 | .936 |
| | | Technician | **3.175*** | .014 |
| | | Pharmacist | .619 | .973 |
| | | Administration officer | **5.543*** | .000 |
| | Nurse Assistant | Doctor | -.321 | .999 |
| | | Staff Nurse | -.774 | .936 |
| | | Technician | 2.401 | .181 |
| | | Pharmacist | -.155 | 1.000 |
| | | Administration officer | **4.769*** | .002 |
| | Technician | Doctor | -2.722 | .054 |
| | | Staff Nurse | **-3.175*** | .014 |
| | | Nurse Assistant | -2.401 | .181 |
| | | Pharmacist | -2.556 | .121 |
| | | Administration officer | 2.369 | .451 |
| | Pharmacist | Doctor | -.167 | 1.000 |
| | | Staff Nurse | -.619 | .973 |
| | | Nurse Assistant | .155 | 1.000 |
| | | Technician | 2.556 | .121 |
| | | Administration officer | **4.924*** | .001 |
| | Administration officer | Doctor | **-5.091*** | .000 |
| | | Staff Nurse | **-5.543*** | .000 |
| | | Nurse Assistant | **-4.769*** | .002 |
| | | Technician | -2.369 | .451 |
| | | Pharmacist | **-4.924*** | .001 |

**Cont.,**

| **Adoption factors** | **Designation** | | **Mean Difference** | **Sig.** |
|---|---|---|---|---|
| Behavioral Intention | Doctor | Staff Nurse | -.167 | 1.000 |
| | | Nurse Assistant | .512 | .995 |
| | | Technician | 2.056 | .438 |
| | | Pharmacist | -.167 | 1.000 |
| | | Administration officer | **5.879*** | .000 |
| | Staff Nurse | Doctor | .167 | 1.000 |
| | | Nurse Assistant | .679 | .981 |
| | | Technician | 2.222 | .348 |
| | | Pharmacist | 0.000 | 1.000 |
| | | Administration officer | **6.045*** | .000 |
| | Nurse Assistant | Doctor | -.512 | .995 |
| | | Staff Nurse | -.679 | .981 |
| | | Technician | 1.544 | .788 |
| | | Pharmacist | -.679 | .987 |
| | | Administration officer | **5.367*** | .003 |
| | Technician | Doctor | -2.056 | .438 |
| | | Staff Nurse | -2.222 | .348 |
| | | Nurse Assistant | -1.544 | .788 |
| | | Pharmacist | -2.222 | .413 |
| | | Administration officer | 3.823 | .121 |
| | Pharmacist | Doctor | .167 | 1.000 |
| | | Staff Nurse | 0.000 | 1.000 |
| | | Nurse Assistant | .679 | .987 |
| | | Technician | 2.222 | .413 |
| | | Administration officer | **6.045*** | .000 |
| | Administration officer | Doctor | **-5.879*** | .000 |
| | | Staff Nurse | **-6.045*** | .000 |
| | | Nurse Assistant | **-5.367*** | .003 |
| | | Technician | -3.823 | .121 |
| | | Pharmacist | **-6.045*** | .000 |
| *. The mean difference is significant at the 0.05 level. | | | | |

The Tukey post hoc test indicated that in system quality, perceived ease of use, perceived behavioral control, attitude, subjective norm and behavioral intention, the mean difference of administration officer differs significantly from all the other groups ($p<0.05$). In computer self-efficacy, facilitating conditions and perceived usefulness, the mean difference of technician and administration officer differ significantly from all the other groups($p<0.05$).

## Results

In system quality, perceived ease of use, perceived behavioral control, attitude, subjective norm and behavioral intention, the mean difference of administration officer differs significantly. In computer self-efficacy, facilitating conditions and perceived usefulness, the mean difference of technician and administration officer differ significantly.

## Discussion

The researcher has found the mediating effect of technological knowledge on two types of healthcare professionals in the ESIC environment. Technicians and Administration officers in the ESIC main hospital and dispensaries are quite comfortable in using the HMIS software. The identified organisational and individual determinants that are key elements to the success of the ambitious interoperable HMIS project were found to greatly influence the working style of the technicians and administration officers in the ESIC healthcare environment. The researcher investigated the possible features of a use-friendly HMIS that healthcare professionals found beneficial during the care process in the ESIC healthcare arena and the positive relationship between perceived benefit and perceived experience of HMIS software encouraged the technicians and administration officers in the ESIC main hospital and dispensaries in the Tirunelveli sub-region to do well in the technology based healthcare domain. Moreover, a wide range of healthcare settings in the ESIC environment ensured greater generalisability of the above found results.

### Limitations of the research

This study has addressed the perspectives and opinions of stakeholders in the ESIC hospital and dispensaries in Tirunelveli sub-region only. However, in future studies, there is a need to elicit the perspectives of stakeholders at government hospitals in the state. Comparative studies could also be carried out between ESIC and state government, private hospitals to determine their differing perspectives regarding HMIS adoption, benefits and barriers. Longitudinal studies of adoption of health information system would provide a holistic understanding of the changes in the adoption process over a period of time.

## CONCLUSION

This study provides unique knowledge on the most important factors to consider in the design of strategies for improving HMIS adoption by healthcare professionals in any software-based working environment. The user-friendly HMIS features identified in this study have been empirically shown to have a positive effect on the perceived benefits of the evolving HMIS medical software. The findings can be used by software vendors to guide their multifaceted-software design and by medical organizations when choosing a HMIS that not only enhances patient experience but also provides a competitive advantage to the healthcare professionals. This study will recommend a novel approach to assess adoption behaviour among healthcare professionals that is likely to be transferrable to other settings in the near future.

## REFERENCES

Chismar, W. G., & Patton, S. W. (2002). Test of the Technology Acceptance Model for the Internet in Pediatrics. *AMIA 2002 Annual Symposium Proceedings* (pp. 155-159). San antonio: Hanley & Belfus.

Gans, D., Kralewski, J., Hammons, T., & Dowd, B. (2005). Medical Groups' Adoption Of Electronic Health Records And Information Systems. *Health Affairs* , 1323- 1333.

Jacucci, E., Shaw, V., & Braa, J. (2006). Standardization of Health Information Systems in South Africa: The Challenge of Local Sustainability. *Information Technology for Development* , Vol. 12 (3) 225–239.

Kalpa, S. (2012). Health IT in Indian Healthcare System: A New Initiative. *Research Journal of Recent Sciences* , 83-86.

Kimaro, H. C., & Nhampossab, J. L. (December 2007). The challenges of sustainability of health information systems in developing countries: comparative case studies of Mozambique and Tanzania. *Journal of Health Informatics in Developing Countries* , 1-10.

Končar, M., & Lončarić, S. (2003). Concept for integrated electronic health records management system. *Informatica medica slovenica* , 1-14.

Krishnan, A., Nongkynrih, B., Yadav, K., Singh, S., & Gupta, V. (2010). Evaluation of computerized health management information system for primary health care in rural India. *BMC Health Services Research* , 13.

Natarajan. S, Panchanathan.V, & Bansal, P. K. (2013). Health Management Information System implemented in Government Hospitals of Tamil Nadu. *International Journal of Scientific & Engineering Research* , 282-288.

Raitoharju, R. (2005). When acceptance is not enough – taking TAM-model into healthcare. *Proceedings of the 38th Hawaii International Conference on System Sciences* (pp. 1-6). Hawaii: IEEE.

Sahay, S., Monteiro, E., & Aanestad, M. (2007). Towards a political perspective of integration in IS research: The case of health information systems in India. *Proceedings of the 9th International Conference on Social Implications of Computers in Developing Countries* (pp. 83–94). São Paulo, Brazi: GRIN Publishing.

Shiferaw, F., & Zolfo, M. (2012). The role of information communication technology (ICT) towards universal health coverage: the first steps of a telemedicine project in Ethiopia. *Glob Health Action* , 1-8.

Sriram, C., & Pichaandy, C. (2022). Role of educational level as moderator in health management information system (HMIS) adoption among healthcare professionals in the ESIC main hospital and dispensaries in the Tirunelveli sub-region. *International Journal of Health Sciences*, *6*(S4), 9329–9335. https://doi.org/10.53730/ijhs.v6nS4.10739.