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# Public Hospital Workers' Views on the Process of Switching from the Hospital Information Management System to the e-Health Information System in a Province

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**ABSTRACT**

The purpose of this study is to investigate the views, reasons for satisfaction, and difficulties encountered by healthcare professionals regarding the Hospital Information Management System (HIMS) in the state hospitals located in Amasya and its surrounding areas. It also assesses the knowledge and experiences of healthcare professionals with e-Health applications in public hospitals, emphasizing their opinions and recommendations for assistance, training, adaptation, and involvement throughout the integration of these applications into healthcare services. The goal of the study is to better understand how healthcare professionals feel about digital technologies and to provide suggestions for improving the quality of healthcare services. The Amasya Provincial Health Directorate oversees four facilities where the research was carried out. Following permission by the ethics committee, data gathering was underway on April 22, 2024, with pilot study carried out in April of the same year. There are 913 healthcare workers in the population, and a minimum sample size of 405 at a 95% confidence interval was found to be appropriate. Using stratified

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sampling, the sample was selected and split into three strata based on occupational groupings. With a median age of 37, 38.8% of the 405 participants were female. 34.2% of physicians, 33.7% of midwives, nurses, and health officers, and 40.4% of medical secretaries and data entry staff expressed satisfaction when HIMS satisfaction was analyzed. One of the key drivers of user satisfaction was the system's ability to reduce errors and streamline workflow. In addition, 42.7% of people worked nights. Physicians used e-Health applications such as e-Prescription and e-Report more often than nurses, midwives, health officials, and medical secretaries. Physicians were more likely to employ telemedicine than other healthcare professionals, who were less knowledgeable in this field. The study recommends developing training methodologies specific to various professional groups and expanding the use of e-Health applications. The study highlights the need for regular in-service training, a more robust technical infrastructure, and user-friendly interfaces to boost healthcare personnel's satisfaction with e-Health. In summary, this study offers important information for strengthening e-Health and HIMS applications and presents important suggestions for enhancing the quality of healthcare services through digital transformation.

**Keywords:** Digital Health Transformation, e-Health Applications, Hospital Information Management Systems (HIMS)

## INTRODUCTION

The healthcare industry is complex and constantly evolving because of the factors like as demographic shifts and technological advancements. This change in areas such as service delivery, patient care, data management, and recordkeeping necessitates the widespread adoption of information technologies to enhance the effectiveness and efficiency of healthcare organizations (Republic of Türkiye Ministry of Health, 2003).

The emergence and widespread acceptance of information technologies in the healthcare industry has led to the use of Hospital Information Management Systems (HIMS). The extensive use of computers and other information technology in healthcare services marked the beginning of this transition (Yurt, 2004). A hospital or another healthcare facility can handle all of its operational and administrative procedures with the help of the Hospital Informa-

tion Management System (HIMS). HIMS is used to track and manage patient records, appointments, treatment plans, medical records, laboratory results, billing, and other operational activities. It also helps information flow between all hospital departments. The primary goals of HIMS are to increase hospital operations' effectiveness and raise the standard of care provided (Republic of Türkiye Ministry of Health, 2015, February 9).

It should be mentioned that HIMS offers benefits, for instance digitizing health data, enhancing patient care, and boosting business process efficiency. Its drawbacks, including significant investment costs, data security threats, and integration difficulties, should also be highlighted. It should be underlined that these systems may provide difficulties with regard to use and accessibility, particularly for small healthcare facilities (Ataklı & Kaplan, 2016; Palvia, 2012; Yui et al., 2012; Ajami & Bagheri-Tadi, 2013; Akça, 2013; Blumenthal, 2017; Mackert et al., 2016).

A larger information system known as "e-Health" is used to support the administration of healthcare services in a country or region. "e-Health" is a term used to describe the planning, monitoring, and assessment of healthcare services as well as the facilitation of information sharing among healthcare professionals. "e-Health" is used not just in operational procedures like hospital management but also in more general domains like epidemiological monitoring, public health management, medical research, and policy creation (Asaro et al., 2001; Eysenbach, 2001).

Today, one of the key methods to ensure that healthcare institutions are successful and efficient is to exploit the opportunities afforded by information technology while maximizing attention to the privacy and security of personal data. While cutting-edge technology like artificial intelligence (AI) and data analytics can be utilized to optimize treatment and care processes for patients, electronic health record systems improve the coordination of patient care. Furthermore, mobile health applications enable "digitally literate" people to monitor and control their health issues, while telemedicine and remote healthcare services increase access to healthcare. These technological advancements could hasten the "human-centered" shift in the healthcare industry, raising the standard of care and elevating patients' quality of life (Turkish Informatics Association, 2004).

The main objective of this study is to investigate the degree of satisfaction and challenges faced by healthcare professionals with the present Hospital Information Management System (HIMS) at the state hospitals in Amasya province and its districts. Additionally, it aims to ascertain their familiarity with, and knowledge of e-Health applications used in public hospitals, as well as their opinions and suggestions about things like assistance, education, flexibility, and participation in the process of incorporating these applications into healthcare services.

## METHODOLOGY

Five sites connected to Amasya Provincial Health Directorate are to host the study. These hospitals include Sabuncuoğlu Şerefeddin Training and Research Hospital in the city center, which has 600 beds; Karamustafa Paşa State Hospital in the Merzifon district, which has 250 beds; Suluova State Hospital, which has 105 beds; Gümüşhacıköy State Hospital, which has 50 beds; and Taşova State Hospital, which has 50 beds. However, 600-bed Sabuncuoğlu Şerefeddin Training and Research facility was excluded from the study's sampling because of the low level of cooperation from this facility throughout the research procedure.

Amasya Provincial Health Directorate and Marmara University Clinical Research Ethics Committee granted their consent for the study on April 22, 2024 (22.04.2024/09.2024.542). After being informed, the study's participating healthcare professionals gave their approval. Data were actively gathered between May and June 2024, and pilot test of the study was carried out in April 2024. The Cronbach's Alpha coefficient ($\alpha$=0.81) was used to assess the data collection tool's dependability, and professional views were sought regarding its validity. In order to assess the survey's efficacy and comprehensibility, pilot research was also carried out in April 2024 with a small sample of participants. Based on the input obtained, the necessary modifications were implemented.

Physicians, nurses, midwives, health officials, medical technicians, technologists, medical secretaries, and data entry staff employed by four public hospitals functioning in four districts of the province of Amasya (N=913) make up the research population. With a 95% confidence interval, 270 people were determined to be the minimal sample size required for the study in order to

accurately reflect the population. With a 50% response rate assumed, 405 (270 x 1.5) was the extended sample size. Using a "stratified sampling" technique, the study's sample was chosen from the population.

Considering the subject of the research and the sample unit and taking into account that the professional requirements related to the use of hospital information management systems and e-Health applications in the population are not homogeneous, it has been deemed more appropriate to select a stratified sample based on professions. Professional groups have been categorized into three separate strata based on the similarities of the services.

The sample unit of the study, which constitutes the universe of the research, consists of a total of 405 employees in four hospitals, with 18% being doctors, 60% being nurses, midwives, health officers, and health technicians, and 22% being medical secretaries and data entry personnel. In this context, 73 doctors from each of the four hospitals, 243 nurses, midwives, health officers, and health technicians, as well as 89 medical secretaries and data entry personnel were selected using simple random sampling from the current lists provided by the Personnel Affairs Department of Amasya Provincial Health Directorate's Personnel Support Services Directorate. In the study, no substitutes were selected, and the aim was to reach the employees chosen through sampling (Table 1).

**Table 1:** Strata and sample distribution in the study

| Strata | Healthcare Workers in Stratum | Population Size | Stratum Weight | Sample Size |
|---|---|---|---|---|
| 1 | Doctor | 163 | 18.0 | 73 |
| 2 | Nurse, Midwife, Health Officer, Health Technician | 542 | 60.0 | 243 |
| 3 | Medical Secretary, Clerk, Data Entry | 201 | 22.0 | 89 |
| **Total** | | 913 | 100.0 | 405 |

The data for the research was obtained through an online survey tool specifically built by the researcher. There are four sections in the data collection tool. The first section includes questions about the socio-demographic characteristics of the participants; the second section addresses their opinions regarding the currently used Hospital Information Management System (HBYS), the reasons for their satisfaction, and any challenges they may have experienced. Questions about e-Health (Electronic Health) apps used in public hospitals can be found in the third section. The opinions and recommendations of the participants on the use, contribution, training, and adaptation of e-Health applications in the shift to healthcare services are finally assessed in the fourth section.

Researchers transferred the data to a Microsoft Excel chart and used IBM SPSS Statistics (Version 24.0) to analyze them. Descriptive data of the participants are presented with summary data such as number, percentage, mean, standard deviation, median. The normality of the data was examined using the Kolmogorov-Smirnov test. Chi-square, Fisher's Exact, Mann-Whitney U, and Kruskal-Wallis tests were used to analyze the differences between groups. All statistical significance was determined at the $p<0.05$ level.

**RESULTS**

The 405 people who were chosen for the study's sample had all of their data fully gathered. 38.8% of the participants (n=248) were female. The participants' median age was 37 years old (min: 22, max: 64, n=405). Male participants had a median age of 42 years (SD: 10.6, min: 22, max: 64, n=157), while female participants had a median age of 36 years (SD: 8.4, min: 22, max: 58, n=248) (pmwu=0.006). Table 2 displays the distribution of the sociodemographic traits of the individuals.

The median total duration of practice for the doctors participating in the study was 3.0 ± 5.9 years (SD: 6.3, min: 1, max: 25). The median total duration of practice for midwives, nurses, and health officers was 12.0 ± 13.6 years (SD: 8.85, min: 1, max: 44) (n=243). The median duration for medical secretaries and data entry personnel was also 16.0 ± 15.4 years (SD: 7.8, min: 1, max: 39) (n=89). Additionally, 42.7% of the participants (n=173) reported that they worked night shifts, while 57.3% (n=232) indicated that they did not (Table 2).

**Table 2:** Socio-demographic characteristics distribution of participants

| Features | Frequency (n) | The Percentage (%) |
|---|---|---|
| **Gender** | | |
| Female | 248 | 38.8 |
| Male | 157 | 61.2 |
| **Age Group** | | |
| <24 | 13 | 3.2 |
| 25-29 | 83 | 20.5 |
| 30-34 | 67 | 16.5 |
| 35-39 | 54 | 13.3 |
| 40-44 | 83 | 20.5 |
| 45-49 | 53 | 13.1 |
| 50+ | 52 | 12.8 |
| **Professional Group** | | |
| Doctor | 73 | 18.0 |
| Nurse, Midwife, Health Officer, Health Technician | 243 | 60.0 |
| Medical Secretary, Clerk, Data Entry | 89 | 22.0 |
| **Total Years in Profession** | | |
| <5 | 115 | 28.4 |
| 5-9 | 39 | 9.6 |
| 10-14 | 84 | 20.7 |
| 15 and above | 167 | 41.2 |
| **Night Shift** | | |
| Yes | 173 | 42.7 |
| No | 232 | 57.3 |
| **Total** | 405 | 100.0 |

Examining how satisfied various professional groups were with the Hospital Information Management System (HBYS), it was discovered that 40.4% of medical secretaries and data entry staff (n=36), 34.2% of doctors (n=25), and 33.7% of midwives, nurses, and health officers (n=82) were "satisfied". Data entry employees and medical secretaries were reported to be happier with HBYS (p=0.057, Table 3).

**Table 3:** HBYS satisfaction distribution by professional groups

| | Very Satisfied | | Satisfied | | Neutral | | Dissatisfied | | Very Dissatisfied | | p |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Professional Group** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** | |
| Doctor | 8 | 11.0 | 25 | 34.2 | 12 | 16.4 | 17 | 23.3 | 11 | 15.1 | 0.057 |
| Nurse, Midwife, Health Officer, Health Technician | 14 | 5.8 | 82 | 33.7 | 79 | 32.5 | 50 | 20.6 | 18 | 7.4 | |
| Medical Secretary, Clerk, Data Entry | 17 | 19.1 | 36 | 40.4 | 10 | 11.2 | 14 | 15.7 | 12 | 13.5 | |
| **Total** | 39 | 9.6 | 143 | 35.3 | 101 | 24.9 | 81 | 20.0 | 41 | 10.1 | |

*Kruskal Wallis-Test

The reasons for satisfaction and the challenges faced by users of the Hospital Information Management System (HIMS) were examined. Since participants were allowed to specify multiple reasons for satisfaction and difficulties encountered, the total percentages exceed 100%. According to the results, the majority of users expressed satisfaction with the system due to its ability to reduce errors (86.9%) and improve workflow (75.3%). However, users also reported experiencing difficulties with certain aspects of the system. Specifically, 58.5% of participants stated that they faced challenges due to occasional system failures and interruptions, while 50.1% mentioned that the time-consuming nature of data entry and update processes was among the most common difficulties (Table 4).

**Table 4:** Reasons for satisfaction and challenges faced in HIMS usage

| Reasons for Satisfaction | n | % | Challenges Faced | n | % |
|---|---|---|---|---|---|
| Quick Access to Patient Information | 275 | 67.9 | Complexity of Menu Navigation | 83 | 20.5 |
| Data Security | 207 | 51.1 | Time-Consuming Data Entry and Update Processes | 203 | 50.1 |
| Improvement of Workflow | 305 | 75.3 | System Failures and Interruptions | 237 | 58.5 |
| Error Reduction | 352 | 86.9 | Data Transfer and Integration Issues | 54 | 13.3 |

In this study, the usage rates of e-Health applications among different professional groups and the statistical differences among them were examined. The use of e-Prescriptions, e-Reports, e-Health records (e-Nabız), and telemedicine was found to be significantly higher among doctors compared to other professional groups (p=0.001, Table 5). Uniform Accounting System (TDMS) and similar applications were not used at all by doctors, while low usage rates were also observed among other professional groups (p=0.001, Table 5). However, the usage rates of the Central Hospital Appointment System (MHRS) did not show a significant difference among the professional groups (p=0.669, Table 5).

**Table 5:** Status of e-Health application usage among professional groups

| Health Professions Groups | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Doctor | | Nurse, Midwife, Health Officer, Health Technician | | Medical Secretary, Clerk, Data Entry | | Total | | p |
| **e-Health Applications** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** | |
| e-Prescription | | | | | | | | | |
| Yes | 58 | 79.5 | 78 | 32.1 | 45 | 50.6 | 181 | 44.7 | * 0.001 |
| No | 15 | 20.5 | 165 | 67.9 | 44 | 49.4 | 224 | 55.3 | |
| e-Report | | | | | | | | | |
| Yes | 55 | 75.3 | 70 | 28.8 | 40 | 44.9 | 165 | 40.7 | * 0.001 |
| No | 18 | 24.7 | 173 | 71.2 | 49 | 55.1 | 240 | 59.3 | |
| e-Nabız | | | | | | | | | |
| Yes | 44 | 60.3 | 71 | 29.2 | 41 | 46.1 | 156 | 38.5 | * 0.001 |
| No | 29 | 39.7 | 172 | 70.8 | 48 | 53.9 | 249 | 61.5 | |
| Telemedicine | | | | | | | | | |
| Yes | 30 | 41.1 | 6 | 2.5 | 17 | 19.1 | 53 | 13.1 | * 0.001 |
| No | 43 | 58.9 | 237 | 97.5 | 72 | 80.9 | 352 | 86.9 | |
| Uniform Accounting System (TDMS) | | | | | | | | | |
| Yes | 0 | 0.0 | 5 | 2.1 | 14 | 15.7 | 19 | 4.7 | ** 0.001 |
| No | 73 | 100.0 | 238 | 97.9 | 75 | 84.3 | 386 | 95.3 | |
| Core Resource Management System (ÇKYS) | | | | | | | | | |
| Yes | 0 | 0.0 | 8 | 3.3 | 10 | 11.2 | 18 | 4.4 | ** 0.001 |
| No | 73 | 100.0 | 235 | 96.7 | 79 | 88.8 | 387 | 95.6 | |
| Material Resource Management System (MKYS) | | | | | | | | | |
| Yes | 0 | 0.0 | 1 | 0.4 | 11 | 12.4 | 12 | 3.0 | ** 0.001 |
| No | 73 | 100.0 | 242 | 99.6 | 78 | 87.6 | 393 | 97.0 | |
| Centralized Hospital Appointment System (MHRS) | | | | | | | | | |
| Yes | 56 | 76.7 | 197 | 81.1 | 73 | 82.0 | 326 | 80.5 | * 0.669 |
| No | 17 | 23.3 | 46 | 18.9 | 16 | 18.0 | 79 | 19.5 | |
| Integrated Corporate Transaction Platform Portal (Ekip Sağlık) | | | | | | | | | |
| Yes | 59 | 80.8 | 182 | 74.9 | 69 | 77.5 | 95 | 23.5 | * 0.561 |
| No | 14 | 19.2 | 61 | 25.1 | 20 | 22.5 | 310 | 76.5 | |
| **Total** | 73 | 100.0 | 243 | 100.0 | 89 | 100.0 | 405 | 100.0 | |

*Pearson Chi-Square ** Fisher's Exact Test

The study found that healthcare workers most frequently request training in user education for e-Health applications, with 74% of doctors, 70.9% of nurses, midwives, health officers, and 69.7% of medical secretaries requesting this training. Technical support demand varied across professional groups, with 58.4% of medical secretaries requesting it. Data security and data analysis training were deemed unnecessary (Table 6).

**Table 6:** Educational needs and participation distribution of healthcare professionals

| Training Topic | Doctor (n=73) | | Nurse, Midwife, Health Officer, Health Technician (n=243) | | Medical Secretary, Clerk, Data Entry (n=89) | | Total (n=405) | |
|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % |
| Technical Support | 16 | 21.9 | 60 | 24.7 | 52 | 58.4 | 128 | 31.6 |
| User Training | 54 | 74.0 | 171 | 70.4 | 62 | 69.7 | 287 | 70.9 |
| Data Security Training | 8 | 11.0 | 20 | 8.2 | 20 | 22.5 | 48 | 11.9 |
| Data Analysis and Reporting | 6 | 8.2 | 21 | 8.6 | 15 | 16.9 | 42 | 10.4 |

The familiarity levels and contribution rates of professional groups with e-Health (Electronic Health) applications while providing services have been examined. There was no significant difference in contribution levels and familiarity among the professional groups. The high contribution rate is 61.6% in the doctor group, while it is 50.2% in the nurse/midwife/health officer group; and it is 60.7% in the medical secretary and data entry personnel group. The difference between the groups in terms of contribution levels is not significant (p=0.140). In terms of familiarity, 61.6% of doctors, 49.4% of the nurse/midwife/health officer group, and 50.6% of medical secretaries and data entry personnel indicated that they were “familiar”. The difference between these groups is also not statistically significant (p=0.258, Table 7).

**Table 7:** Distribution of familiarity with e-Health applications and contribution levels to service provision by professional groups

| | High Contribution | | Middle Contribution | | Low Contribution | | p | Familiar | | Slightly Familiar | | No Familiarity | | p |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Professional Group** | n | % | n | % | n | % | | n | % | n | % | n | % | |
| Doctor | 45 | 61.6 | 11 | 15.1 | 17 | 23.3 | | 45 | 61.6 | 11 | 15.1 | 17 | 23.3 | |
| Nurse, Midwife, Health Officer, Health Technician | 122 | 50.2 | 65 | 26.7 | 56 | 23.0 | **0.140** | 120 | 49.4 | 54 | 22.2 | 69 | 28.4 | **0.258** |
| Medical Secretary Clerk, Data Entry | 54 | 60.7 | 21 | 23.6 | 14 | 15.7 | | 45 | 50.6 | 18 | 20.2 | 26 | 29.2 | |
| **Total** | 221 | 54.6 | 97 | 24.0 | 87 | 21.5 | | 210 | 51.9 | 83 | 20.5 | 112 | 27.5 | |

*Kruskal Wallis-Test

Health professional groups expressed similar opinions, with 75.3% of doctors, 67.5% of midwives/nurses/health officers, and 64.0% of medical secretaries and data entry personnel stating that e-Health applications are "good but need improvement" (p=0.289, Table 8). Regarding the improvement of e-Health applications, 87.7% of doctors, 70.4% of midwives/nurses/health officers, and 79.8% of medical secretaries and data entry personnel suggested that regular in-service training should be provided (p=0.006, Table 8). On the implementation of a reward system, 26.0% of doctors, 39.1% of midwives/nurses/health officers, and 48.3% of medical secretaries and data entry personnel indicated that rewarding is necessary (p=0.015, Table 8). In terms of ease of use, 31.5% of doctors, 32.9% of midwives/nurses/health officers, and 41.6% of medical secretaries and data entry personnel stated that using e-Health applications is easy (p=0.283, Table 8). Regarding the user-friendliness of these applications, 35.6% of doctors, 38.3% of midwives/nurses/health officers, and 37.1% of medical secretaries and data entry personnel noted that these applications are user-friendly (p=0.915, Table 8). On the other hand, concerning data security, 27.4% of doctors, 39.9% of midwives/nurses/health officers, and 30.3% of medical secretaries and data entry personnel believe that data security is ensured (p=0.074, Table 8).

**Table 8:** Opinions on the use of e-Health applications and recommendations from healthcare personnel for increasing usage

| Health Professions Groups | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Doctor | | Nurse, Midwife, Health Officer, Health Technician | | Medical Secretary, Clerk, Data Entry | | p |
| | n | % | n | % | n | % | |
| **Opinions** | | | | | | | |
| Very good, it should be promoted | 18 | 24.7 | 79 | 32.5 | 32 | 36.0 | 0.289 |
| Good, but there is a need for improvement | 55 | 75.3 | 164 | 67.5 | 57 | 64.0 | |
| **Suggestions** | | | | | | | |
| Regular In-Service Training | | | | | | | |
| Yes | 64 | 87.7 | 171 | 70.4 | 71 | 79.8 | 0.006 |
| No | 9 | 12.3 | 72 | 29.6 | 18 | 20.2 | |
| Rewarding System | | | | | | | |
| Yes | 19 | 26.0 | 95 | 39.1 | 43 | 48.3 | 0.015 |
| No | 54 | 74.0 | 148 | 60.9 | 46 | 51.7 | |
| Ease of Use | | | | | | | |
| Yes | 23 | 31.5 | 80 | 32.9 | 37 | 41.6 | 0.283 |
| No | 50 | 68.5 | 163 | 67.1 | 52 | 58.4 | |
| User-Friendly | | | | | | | |
| Yes | 26 | 35.6 | 93 | 38.3 | 33 | 37.1 | 0.915 |
| No | 47 | 64.4 | 150 | 61.7 | 56 | 62.9 | |
| Data Security | | | | | | | |
| Yes | 20 | 27.4 | 97 | 39.9 | 27 | 30.3 | 0.074 |
| No | 53 | 72.6 | 146 | 60.1 | 62 | 69.7 | |
| **Total** | 73 | 100.0 | 243 | 100.0 | 89 | 100.0 | |

*Pearson Chi-Square

## DISCUSSION

The levels of satisfaction and challenges experienced by healthcare personnel working in public hospitals in four districts of Amasya Province regarding the current Hospital Information Management System (HBYS) were examined, along with the use of e-Health applications and suggestions for increasing their utilization. Data was collected through an online survey from a total of 405 individuals, with 38.8% being female and 61.2% male. According to the research results, the satisfaction rate of employees with the HBYS is found to be approximately 45%.

When examining the satisfaction levels of different professional groups, it was observed that the satisfaction levels towards the HBYS were generally similar among the professional groups, but doctors showed more dissatisfaction, while medical secretaries and data entry personnel had higher satisfaction levels. This difference was not found to be statistically significant. In the study by Gökkaya and İzgüden (2022), it was found that physicians showed lower satisfaction with digital hospital applications compared to administrative staff. This situation suggests that physicians have a more negative perception of digital applications and that the intensity of clinical duties may affect their experience of using these digital applications.

The main reasons contributing to the high levels of satisfaction with the Hospital Information Management System (HBYS) are workflow improvement and error reduction. These findings indicate that the system offers significant advantages, such as enhancing efficiency and reducing error rates. Furthermore, ease of access to patient information and data security emerges as other important sources of satisfaction. However, the main issues encountered in system usage include system failures and interruptions, as well as the time-consuming processes of data entry and updates. These issues can negatively affect users' daily workflows and reduce satisfaction. Complexity between menus and integration problems have also been occasionally raised, but these problems are reported less frequently compared to other issues. These findings are similar to the results of Bayer et al. (2019). These results indicate that improvements are necessary for HBYS systems, particularly in speeding up technical failures and data processes. Additionally, simplifying the user interface and integration processes can positively impact user experience.

The rates of e-Health application usage among occupational groups and the statistical differences between these groups have been examined. It was found that doctors have a higher usage rate of e-Prescription and e-Report compared to other occupational groups. The study by Yetkin (2021), examined doctors' views on electronic prescription applications within health information systems and found similarities with our study.

When we examined employees' usage of Sağlık.NET (e-Nabız) and telemedicine, our results showed significant differences in e-Health and telemedicine usage among occupational groups when compared to the findings of Çabuk (2023) and Kaya (2020). In Kaya's (2020) study, it was found that the e-Health knowledge of managerial/responsible doctors was different from that of other healthcare workers, while our study determined that doctors' telemedicine usage was higher than that of other healthcare workers. Çabuk's (2023) study revealed that healthcare personnel had a positive attitude towards telemedicine applications and that licensed healthcare workers had a higher awareness than doctors. These findings support the overall positive trends toward telemedicine and e-Health applications and indicate significant differences in e-Health and telemedicine usage among occupational groups. Furthermore, administrative applications such as the Uniform Accounting System (Tekdüzen Muhasebe Sistemi - TDMS), Core Resource Management System (Çekirdek Kaynak Yönetim Sistemi - ÇKYS), and Material Resource Management System (Mal Kaynakları Yönetim Sistemi - MKYS) were not used at all by doctors at all, and it had very low usage rates among other occupational groups. This situation indicates that there are differences in the use of applications specific to each occupational group and highlights the need for customized training and support strategies tailored to the needs of each group. It can be said that these differences emphasize the importance of customized approaches for the more effective adoption of e-Health applications.

In our study, it was determined that there is no statistically significant difference in the usage rates of the Integrated Corporate Process Platform Portal (Ekip Sağlık) and the Central Hospital Appointment System (Merkezi Hekim Randevu Sistemi - MHRS) among occupational groups. However, it was found that the usage rates of Integrated Corporate Process Platform Portal and Central Hospital Appointment System are higher than those of other digital health

applications. This finding indicates that Integrated Corporate Process Platform Portal and Central Hospital Appointment System are widely and similarly used by healthcare personnel, thereby not creating a significant difference among occupational groups. As Alay & Tüfekci (2023) state that applications developed for healthcare workers, such as Sağlık TİM, İnme 112, EKİP, and UMKE, facilitate communication and coordination, balance the workload more effectively, and provide opportunities for quick actions and interventions. Additionally, it was found that the usage rates of MHRS among healthcare workers are high. Çiftçi & Bostan (2016) state that changes made within the framework of the Health Transformation Program positively affect the quality of services, costs, healthcare worker satisfaction, and the understanding of service in hospitals. Uysal & Ulusinan (2020) emphasize the importance of e-Nabız and MHRS in accessing health information and making appointments, stating that these applications play critical roles in the healthcare sector. Thanks to these applications, patients can make appointments without wasting time, while healthcare professionals can perform their processes more efficiently.

When examining the views and suggestions of occupational groups regarding e-Health applications, it was observed that they generally made similar assessments about these applications; however, there are some differences among occupational groups regarding areas for improvement. Doctors, nurses/health officers, and medical secretaries/data entry personnel mostly stated that the applications are good but need improvement (p=0.289). Particularly among doctors, the demand for regular in-service training is high (87.7%), and this demand is widespread among occupational groups (p=0.006). Regarding rewards, medical secretaries requested more rewards (48.3%), while doctors were less demanding in this regard (26.0, p=0.015). There was no significant difference among occupational groups regarding ease of use and user-friendliness (p=0.283 and p=0.915). However, concerning data security, doctors expressed more concern than other groups (p=0.074). The study by Baş (2023) emphasizes that healthcare workers resist digital applications and find using paper more practical. In contrast, in our study, healthcare workers generally expressed positive views on e-Health applications. This difference may be due to the fact that face-to-face interview methods were utilized in Baş's study and the observation of employees' difficulties in abandoning their habits. However, both studies highlight the com-

mon finding that there is a need for improvements in education and technological infrastructure. While Baş's study addressed deficiencies in alert systems, our study also emphasized the training needs of occupational groups, indicating that there are still areas open for improvement in the use of digital systems. These findings indicate that e-Health applications are generally accepted, but there are expectations for some improvements from occupational groups.

## CONCLUSION

The study examined the satisfaction levels of healthcare workers regarding the existing Hospital Information Management System (HBYS) in public hospitals in Amasya and the challenges they face. Among the 405 healthcare personnel who participated in the research, a satisfaction rate of 45% highlights the positive impacts of HBYS on employees, emphasizing benefits such as the system's user-friendly nature and increased efficiency. Particularly, medical secretaries and data entry personnel showed higher satisfaction than other professional groups due to their more intensive daily use of the system. This satisfaction is thought to be related to HBYS's facilitation of work processes and enhancement of operational efficiency.

However, significant challenges encountered in the use of HBYS include technical issues such as system failures and the time-consuming nature of data entry and update processes. These problems can adversely affect users' workflows and diminish satisfaction. In this context, there is a need to focus on technical improvements for the system, specifically reducing technical failures and accelerating data processing.

Furthermore, examining the usage rates of e-Health applications reveals that doctors utilize applications such as e-Prescription and e-Report more than other professional groups. Additionally, significant differences among professional groups were observed in the use of telemedicine and e-Nabız. Telemedicine usage is particularly prevalent among doctors, while other healthcare personnel have less familiarity with it. This situation indicates the necessity for broader dissemination of e-Health applications and the development of training strategies tailored to different professional groups. Systems like Integrated Corporate Process Platform Portal (Ekip Sağlık) and the Central Hospital Appointment System (Merkezi Hekim Randevu Sistemi - MHRS) exhibit similar usage rates across professional groups, indicating that these applications are widely and effectively used.

This research has some limitations. Due to being a cross-sectional study, while the current situation can be identified, definitive conclusions about cause-and-effect relationships cannot be drawn. Additionally, sufficient participation could not be achieved from the 600-bed Sabuncuoğlu Şerefeddin Training and Research Hospital because the study is based on voluntary participation. The online survey method used in the data collection process may have prevented some healthcare workers with limited digital literacy or time constraints from participating. Data obtained from different regions and types of hospitals could increase the applicability of the results to a broader population. In our study, potential influencing variables such as demographic factors were overlooked, so more comprehensive analyses that include factors like age and education level can be conducted in the future. Compared to the findings in the literature, the result that doctors show lower satisfaction with digital hospital applications is noteworthy. In future studies, it would be beneficial to conduct further research on the reasons behind any dissatisfaction. In conclusion, the limitations of our study provide a foundation that encourages broader and more in-depth analyses of digital health applications and HIS satisfaction.

Finally, to enhance the overall satisfaction of healthcare workers regarding e-Health applications, it is emphasized that additional training, strengthening of technical infrastructure, and the provision of user-friendly interfaces are essential. Although there are varying expectations among professional groups, all employees have communicated similar demands for the improvement of systems. This study provides significant data for improvements in both HBYS and e-health applications and offers roadmaps for the development of these systems.

**Ethical Approval:** Marmara University Non-Interventional Clinical Research Ethics Committee - 22.04.2024 (Number: 22.04.2024/09.2024.542)

**Authors' Contributions:** The data of the study were collected and analyzed by İN. The authors are taken parts in the writing of the article for abstract and introduction İN, for methods İN, for results İN also, for discussion and conclusion both authors have part in. Besides, the parts of article were arranged by İN and ANÖ. Both authors read and approved the final version of the manuscript.

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