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# The potential and concerns of medical secretaries in a workplace that is becoming more digitalized

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**ABSTRACT**
**Background**: Digital transformation in healthcare is reshaping work environments, including non-clinical roles such as medical secretaries. These professionals play a crucial part in ensuring the smooth operation of healthcare systems, yet their experiences with digitalization remain underexplored. This study explores how medical secretaries perceive digital transformation in healthcare, with a particular focus on its impact on workplace culture, employee well-being, and their evolving roles.
**Methods**: A mixed-methods approach was employed within a public healthcare organization. The study utilized an exploratory sequential design, beginning with a Quality Café to collect qualitative data followed by semi-structured interviews with 20 medical secretaries. The qualitative data were analyzed using thematic analysis, while a questionnaire, developed from the interview findings, was used to collect quantitative data. Factor analysis and non-parametric correlation analysis were applied to the quantitative data to explore the relationships between workplace digitalization and employee health outcomes.
**Results:**The qualitative analysis revealed two main themes: "Facilitating Digital Transformation" and "Recognition and Empowerment." Medical secretaries reported increased responsibilities and changes in their tasks, particularly with the adoption of voice recognition technology. However, they expressed concerns about a lack of involvement in decision-making and a feeling of being undervalued. Some viewed digitalization as a positive force, enhancing patient safety and reducing administrative stress, while others feared it would erode traditional tasks, such as transcription. Quantitative data confirmed that digitalization was associated with improved job satisfaction for some but heightened stress for others, depending on the level of involvement in the transformation process.
**Conclusion:** The findings highlight the dual nature of digital transformation in healthcare for medical secretaries. While digital tools can streamline tasks and enhance patient care, successful integration requires clear communication, involvement, and recognition of their role. Medical secretaries' experiences underscore the need for inclusive digital transformation strategies that consider the perspectives and well-being of all staff members to ensure effective and sustainable healthcare change.

**Keywords:** communication, involvement, Transformation, organization.

## INTRODUCTION

Digital transformation significantly impacts various industries, including healthcare (Harteis, 2018; Sætra and Fosch-Villaronga, 2021). Previous studies have highlighted how digitalisation influences work routines, learning processes, and the evolving skill sets required of employees (Gjellebæk et al., 2020). While digital technologies and services were first embraced in sectors like banking, their integration in healthcare systems has historically been slower (Øvretveit, 2019). Today, healthcare systems employ a variety of digital tools and services, though many efforts remain confined to pilot programs or independent private initiatives.
From an organisational standpoint, the digitalisation of healthcare can foster better collaboration and improve the efficiency of care pathways (Bossen et al., 2014). However, it can also disrupt existing power structures,

potentially threatening traditional roles (Bossen et al., 2014). Digitalisation offers potential solutions to the increasing patient load and workforce shortages in healthcare (Blease et al., 2018; Lai et al., 2020), but navigating the shift between established and new methods reveals the complexity of transforming healthcare organisations. This dynamic process can create tensions in workplace environments (Östlund, 2017). When considering the perspective of medical secretaries, the tasks emerging from this complex organisational change (Star and Strauss, 1999) can be viewed through the concept of "articulation work," which refers to the effort required to manage unforeseen challenges within both individual technology use and collaborative settings (Strauss, 1985).

Moreover, technology has the potential to assist or even replace some of the administrative duties traditionally performed by healthcare professionals (De Maeseneer et al., 2019; Erickson et al., 2017). However, healthcare digitalisation must be thoughtfully integrated (Butcher and Hussain, 2022), and its successful implementation often depends on the active involvement of staff (Garmann-Johnsen et al., 2020; Gjellebæk et al., 2020). To understand the impact of digitalisation on healthcare workplaces, it is essential to assess how it affects job tasks and the workforce, though these effects can be unpredictable (Barley, 2020).

While there is growing literature on clinicians' experiences with digitalisation in healthcare (Laukka et al., 2020; Shinners et al., 2020), the rapid pace of technological advancements calls for further research on the impacts of digital transformation, particularly in non-clinical roles such as medical secretaries (Bossen et al., 2012; Holten Møller and Vikkelsø, 2012). Medical secretaries play a critical role in maintaining the efficiency and smooth operation of healthcare systems. As non-clinical staff, they are integral to the successful implementation of digital changes in healthcare (Bossen et al., 2012). Despite their importance, the role of medical secretaries remains underexplored in academic research (Bossen et al., 2012; Karlsson, 2009). Therefore, further studies are needed to understand how medical secretaries experience digital transformations and their level of involvement in these changes (Zuin and Findlay, 2014). This mixed-methods study aims to examine how medical secretaries perceive digital transformation in healthcare environments, focusing on the impact on workplace culture and employee well-being.

## Theoretical Concepts

### Medical Secretaries

The precise origins of the medical secretary role are difficult to pinpoint, but historical records from the late 19th century indicate that administrative staff had begun performing clerical duties in healthcare settings across Europe (Tyler & Cummins, 2004). Initially referred to as "doctors' secretaries," these professionals were responsible for managing administrative tasks to assist doctors (Bertelsen & Nøhr, 2006). In modern healthcare systems, medical secretaries play a critical role (Medford, 2013; Hooke, 2016) by supporting the organization and efficiency of healthcare operations (Medford, 2013). Their administrative work allows clinicians to focus more on patient care, which improves the overall effectiveness of healthcare delivery (Kennedy, 2016; Hooke, 2016).

Medical secretaries manage a wide array of administrative duties, such as document filing, editing, and transcribing clinician dictations (Alis & Blair, 2003; Mohr et al., 2003; Laerum et al., 2004), printing medical records (Reddy & Spence, 2008), and staffing reception areas (Schmidt et al., 2007). They also handle patient interactions and manage clinical test results (Alis & Blair, 2003). Their work is critical to maintaining diagnostic accuracy and ensuring the quality and completeness of medical documentation (Johansen et al., 2015; Bossen et al., 2012). In some cases, medical secretaries are expected to apply specific clinical knowledge when engaging with patients or transcribing clinician reports (Agrawal et al., 2020; Bertelsen & Nøhr, 2006).

Research suggests that medical secretaries are essential for bridging the gap between healthcare delivery systems and the service-oriented aspect of healthcare, implying that their role extends beyond mere documentation tasks (Hooke, 2016; Morgan, 2022). With the rise of healthcare digitalisation, their role is likely to become even more crucial (Bossen et al., 2014), requiring a rethinking of their responsibilities (Morgan, 2022). In this context, medical secretaries can play a key role in enhancing patient care through their involvement in multidisciplinary teams (Agrawal et al., 2020), although strategically integrating digital tools and providing sufficient training are essential to maximize their contribution (Morgan, 2022).

### Shift in Healthcare Tasks

Healthcare digitalisation often involves converting paper-based documents into digital formats (digitisation) (Bhavnani et al., 2016), but more complex digital transformations involve technologies that assist or even replace human tasks (digitalisation) (Bhavnani et al., 2016). These advancements require healthcare workers to develop new skills to adapt to these technologies (Bossen et al., 2014).

The integration of digital technologies has led to significant changes in the work routines of medical secretaries (Bertelsen & Nøhr, 2006), as some tasks have been eliminated, others reassigned, and new responsibilities have emerged. Although medical secretaries have experienced changes in their roles due to digitalisation over the past two decades (Bossen et al., 2014), the introduction of electronic systems, such as electronic medical records

(Laerum et al., 2004) and voice recognition software for transcription (Hodgson &Coiera, 2016; Parente et al., 2004), has introduced even more changes. As a result, medical secretaries have had to adapt to a rapidly evolving work environment where tasks are constantly shifting across different occupations (Bossen et al., 2014).

**Workplace Health Promotion**

A salutogenic approach to workplace health promotion emphasizes that work environments can enhance employees' health and well-being (Antonovsky, 1987, 2002). This approach uses the concept of "Sense of Coherence" (SOC), which is made up of three key components: comprehensibility, manageability, and meaningfulness. These factors influence individuals' health and are shaped by life experiences, including work-related experiences. A strong SOC is correlated with better quality of life, health, and job satisfaction, and has been applied in studies focused on healthcare workers' well-being (Nilsson et al., 2012).

SOC has proven to be an effective tool for improving workplace health, as fostering these components can lead to better health outcomes and higher job satisfaction (Bakker & Demerouti, 2007). The concept is particularly relevant in healthcare settings, where the increasing digitalisation of workplaces may result in emotional disengagement among employees, diminishing the sense of meaningful work and potentially disrupting social interactions (Palumbo, 2022). Moreover, work-life health is influenced by a positive work climate, the ability to influence one's work situation, and access to appropriate resources (Kira & Forslin, 2008).

**METHODOLOGY**

This study was conducted within a public healthcare organization that includes various healthcare facilities, such as hospitals, primary care centers, and specialized care centers. The research design followed a grounded theory approach, with the methodology evolving progressively as the data collection unfolded, rather than adhering to a strict, linear format (Chun Tie et al., 2019). This iterative development aligns with the concept of "mixed grounded theory" (MGT), which integrates grounded theory (GT) (Glaser and Strauss, 2006) with mixed methods (Creswell and Plano Clark, 2017), allowing for a flexible approach as the study progressed (Creamer, 2021; Johnson and Walsh, 2019).

The data collection process employed an exploratory sequential mixed-methods design (Creswell and Plano Clark, 2017). Initially, a Quality Café (Lagrosen, 2017) was held to gather qualitative data in the first phase. The insights from this session were then used to develop an interview guide for the second phase, which involved semi-structured individual interviews (Patton, 2014), featuring open-ended questions (Britten, 1995). This approach capitalized on the dynamic nature of group discussions in the Quality Café to foster dialogue, while individual interviews provided a deeper understanding from specific participants (Kidd and Parshall, 2000). The design aimed to leverage the complementary strengths of both methods, starting with the group discussions to gather broader data before conducting the individual interviews to explore more detailed perspectives (Powell and Single, 1996).

The data from both qualitative phases were initially analyzed separately using thematic analysis, which is a systematic approach particularly suitable for analyzing interview data in grounded theory research (Chapman et al., 2015). Following this, the results from both datasets were compared to identify similarities and construct a unified synthesis (Cronin et al., 2008). The priority was to highlight the participants' experiences and concerns, developing theories directly from the data without preconceived notions, in line with grounded theory principles (Glaser and Strauss, 2006).

For the quantitative data collection, the questionnaire was designed based on the findings from the qualitative phases. The quantitative phase aimed to achieve two objectives: first, to confirm the qualitative results by incorporating organizational and workplace-related items from the interview guide; and second, to introduce health-related topics, further enriching the evidence collected through the iterative process of MGT (Creamer, 2021; Johnson and Walsh, 2019). The study was approved by the relevant ethical review authority and adhered to COREQ reporting guidelines (Tong et al., 2007).

**Participant Eligibility and Recruitment**

The inclusion criteria for all phases of the study required participants to be employed as medical secretaries within the public healthcare organization. Purposeful sampling was employed, as this method is ideal for gathering insights from a specific group (Campbell et al., 2020). In February 2022, all medical secretaries in the organization (approximately 300 individuals) were contacted via email to provide information about the study. Those who expressed interest in participating received detailed information about the study's purpose, the ethical considerations involved, and the consent process, along with instructions for scheduling interviews. Twenty-four medical secretaries expressed willingness to participate, but due to time constraints, interviews could not be arranged for four of them, resulting in a total of 20 completed interviews.

**Data Collection**

**Quality Café**

In October 2021, a Quality Café was conducted with 14 medical secretaries from two clinics. The researchers facilitated this session, which lasted three hours and was conducted in the native language. The Quality Café approach was developed to merge the World Café method with quality improvement practices, encouraging open dialogue on a central topic. The discussion focused on how medical secretaries could contribute to the development of eHealth.

Following an introduction, participants were grouped into smaller teams of four to five individuals. The session consisted of three group discussions, each lasting about 30 minutes, with participants rotating between groups. One person remained at each table as the host to document the discussions, and these notes were later presented by the hosts.

Participants were then divided into two groups, each using a flipboard to collaboratively build an affinity diagram, which developed over the course of the session. Afterward, a final session was held to present the results and facilitate a concluding discussion. The entire process was documented by two researchers for later content analysis.

**Qualitative Individual Interviews**

From April to May 2022, 20 interviews were conducted with medical secretaries from various departments within the organization. One participant had previously taken part in the Quality Café, while the other 19 were new participants. The interview guide, informed by the Quality Café results, included three main themes:

1. General questions about workplace digitalization.
2. Digitalization's impact on the role of medical secretaries, including recognition of their potential and contributions to organizational progress.
3. Conditions necessary for digitalization, such as advanced technological solutions and sufficient IT support.

Interviews ranged from 42 to 60 minutes (average: 51 minutes), with most conducted via video conference (19 out of 20), and one over the phone. All interviews were recorded, with participants giving verbal consent before the recording commenced. The interview guide was pilot-tested with one medical secretary to refine and ensure its relevance.

**Questionnaire**

The questionnaire consisted of 40 items (excluding demographic questions), developed based on the earlier qualitative findings. It also included two health-related indices used in previous studies: one assessing participants' self-reported health and the other evaluating the dimensions of Sense of Coherence (SOC).

The responses were assessed using an 11-point Likert scale, as recommended to allow for more continuous data analysis.

**Data Analysis**

Quality Café and Individual Interviews

A thematic analysis using an inductive approach was applied to the notes from the Quality Café sessions, the affinity diagrams, and the interview transcripts. This process involved six steps, starting with familiarization with the data, followed by coding, iterative construction of categories, and finally implementing the analysis. The qualitative data were organized through a coding scheme derived from both phases.

Questionnaire

Factor Analysis

Prior to the main analyses, preparatory tests were conducted to assess the normality of the data using the Shapiro-Wilk test. As the data were not normally distributed, principal axis factoring was performed. This method takes into account all variances, including errors, and accepts that errors may exist within the data.

To assess dimensionality, both Promax and Varimax rotations were applied to the factor analysis. While both methods produced similar results, the Promax rotation, which allows for correlated factors, was chosen due to its greater consistency in factor loadings. This rotation method is commonly used in social science research to explain relationships between variables.

A factor-loading threshold of 0.32 was applied, which indicates that the items explain at least 10% of the variance in their respective factors. Each factor needed at least three items with loadings of 0.32 or higher.

Non-Parametric Correlation Analysis

As the factors did not follow a normal distribution, a non-parametric correlation analysis was used to examine the relationships between the health indices and the factors in the seven-structure model.

**Results**

**Qualitative Data Analysis – Interviews**

The qualitative analysis identified two primary themes, which were further divided into four categories (refer to Table 1). The categories were directly derived from the data, as suggested by Braun and Clarke (2006), without the application of a predefined coding structure.

**Facilitating Digital Transformation**

All participants noted that the incorporation of new tasks and processes had become an increasing part of their daily responsibilities, especially with the adoption of voice recognition technology. Receiving information in advance about upcoming changes was emphasized as vital, along with the need to feel included in the workplace's long-term planning. However, most respondents reported that they were often the last to be informed about changes, typically after the implementation had already begun.

The necessity of having clearly defined objectives and strategies for digital transformation was stressed by the medical secretaries, with an understanding that each workplace had unique requirements. Some participants expressed a sense of resignation toward changes, feeling they had to accept whatever was introduced, particularly in a public-sector environment undergoing digital transformation. The importance of involving all staff in digitalization initiatives and fostering engagement across roles was also highlighted.

**Recognition and Empowerment**

The participants revealed that there were enduring stereotypes surrounding the role of medical secretaries, and they felt their occupation was often undervalued. Many respondents noted that their roles within healthcare organizations were misunderstood, with a lack of recognition for their contributions to the daily operations of the workplace. Most participants emphasized the need for greater acknowledgment, both at the societal level and within their individual organizations. They felt their input was frequently disregarded, especially in discussions regarding workplace changes.

Respondents also reported feeling overlooked in comparison to other healthcare workers, often not receiving the same respect or recognition as clinicians. Although organizational culture seemed to promote collaboration across disciplines, the hierarchy in workplace roles was seen as a barrier to involving medical secretaries in the digital transformation process.

**Concerns and Uncertainties**

The implementation of new changes had led some medical secretaries to express concerns about the future of their profession, particularly regarding how the evolution of their daily tasks might affect their roles. Many saw transcription and dictation handling as core elements of their job, tasks they took great professional pride in. The shift away from these duties, replaced by tasks like proofreading and editing automatically generated documents, led to feelings of loss.

Some respondents feared that the digitalization process might lead to greater patient interaction due to increased phone call management and reception duties, though a few saw this as a positive shift, adding variety to their workday.

**Digitalization as an Empowering Tool**

For some participants, the digital transformation was seen as a positive change, even if it disrupted the traditional role of medical secretaries. The improvement in patient safety due to the reduction of paper records was seen as an advantage, as physical documents were at risk of being misplaced. Additionally, the reduction in dictation transcription was seen as a stress-reliever for some respondents.

A few participants felt that digitalization could promote more interdisciplinary collaboration, thereby strengthening the role of medical secretaries and enhancing their professional recognition. Some even saw digital transformation as a potential pathway for career advancement, as it expanded the scope of their work and opened up new opportunities for personal and professional development.

**Quantitative Data Collection: Survey**

The survey garnered 181 responses, with 96% of the participants being women, resulting in a response rate of 64%, which is slightly higher than the typical response rate for online surveys (Wu et al., 2022).

**Descriptive Statistics**

The age and workplace distribution of the participants are summarized in Table 2.

**Factor Analysis**

The Kaiser–Meyer–Olkin (KMO) measure for sample adequacy was 0.854, indicating an excellent level of adequacy for the sample size (Field, 2009). The Bartlett's test of sphericity yielded a significant result ($p = 0.000$). This result suggests that the correlation matrix is significantly different from an identity matrix, meaning the variables are not uncorrelated, and is appropriate for further analysis. Given the high KMO value and the significant Bartlett's test ($p = 0.000$), the data were deemed suitable for factor analysis (Field, 2009).

Principal axis factoring was performed, initially including 34 items. One factor, however, consisted of only two items, which was removed based on prior recommendations (Costello & Osborne, 2005). The factor analysis

revealed that the 33 items were organized into seven distinct factors. The distribution of the items, factor loadings, and dimensions is shown in Table 3.

**Non-Parametric Analysis**

Spearman's rank correlation coefficient was used to explore potential relationships between the independent variables (identified factors from the factor analysis) and dependent variables (health indices). The analysis showed significant positive correlations between perceived health and Factors 1, 2, and 5. Additionally, positive correlations were found between the SOC index and Factors 1, 2, 3, 5, and 7, with moderate correlations observed between all items (Akoglu, 2018; Table 4).

Furthermore, a Kruskal–Wallis test (Ostertagová et al., 2014) was applied to examine potential differences among items and health indices, treating age as an independent variable. Statistically significant differences ($p < 0.050$) were observed between participants aged 35 years or younger and those aged 51 years or older. These differences were found in the item "I am rarely tired" within health index 1 and the item "I often reflect on how my workday will turn out in relation to digitalization" within Factor 4 (concerning worries and concerns).

**Table 1.** Themes and categories from the qualitative data

| **Digitalisation as part of workplace change** | | **A changing role of the medical secretary?** | |
|---|---|---|---|
| Paving the way for digitalisation | Acknowledgment and self-empowerment | Digitalisation as an enabler | Thoughts and fears |

**Table 2.** Descriptive statistics

| **Workplace** | | **Full sample** | **Primary care and rehabilitation** | **Psychiatric care** | **Specialist care** | **Other** |
|---|---|---|---|---|---|---|
| Number | | N = 181 | N = 52 (52 %) | N = 21 (12 %) | N = 107 (60 %) | N = 1 (1 %) |
| Age | 35 years or younger | 28 | 3 | 4 | 20 | 1 |
| | 36–50 years | 55 | 12 | 7 | 36 | 0 |

**Table 3.** Items, factor loadings (loading items), dimensions and total of variance explained

| **Factors (number of loading items)** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Item** | **1 (6)** | **2 (5)** | **3 (6)** | **4 (5)** | **5 (4)** | **6 (3)** | **7 (3)** | **Dimension** |
| Forward planning and implementation workplace digitalisation | 0.948 | −0.057 | 0.091 | 0.054 | 0.063 | 0.023 | −0.069 | Digital inclusiveness: To be included in implementation of digitalisation initiatives |
| Assessment and evaluation of digitalisation initiatives | 0.912 | −0.041 | 0.017 | 0.006 | 0.117 | −0.004 | −0.083 | |
| Provided information regarding digitalisation initiatives | 0.840 | 0.104 | −0.078 | 0.070 | −0.072 | −0.055 | 0.078 | |
| Workplace digitalisation: participation and involvement | 0.712 | −0.032 | 0.066 | 0.050 | 0.062 | 0.136 | −0.342 | |
| Clear purposes of digitalisation implementation | 0.643 | 0.099 | 0.001 | −0.061 | −0.085 | −0.003 | 0.259 | |
| Possible changes for the profession due to digitalisation | 0.465 | 0.140 | −0.192 | 0.040 | 0.131 | 0.192 | −0.094 | |
| Efficiency of education | −0.022 | 0.953 | −0.080 | 0.089 | −0.032 | 0.084 | 0.013 | Educational aspects: To have knowledge and time set aside for education |
| Sufficient education | −0.057 | 0.885 | −0.116 | 0.202 | 0.069 | 0.124 | 0.056 | |
| Time allotted to education | 0.024 | 0.808 | 0.256 | −0.108 | −0.028 | −0.021 | −0.121 | |
| Adequate support and help | 0.150 | 0.632 | 0.002 | 0.114 | 0.064 | −0.028 | 0.100 | |
| Sufficient time allotted to education | 0.198 | 0.612 | 0.262 | −0.210 | −0.044 | −0.276 | −0.162 | |
| Digitalisation may | −0.190 | 0.128 | 0.945 | −0.009 | 0.071 | 0.088 | −0.130 | Positive impact of |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| promote the development of medical secretaries | | | | | | | | digitalisation: Increased opportunities in a digitized workplace |
| Digitalisation as a career enabler | −0.241 | 0.240 | 0.790 | 0.048 | 0.015 | 0.126 | −0.055 | |
| Digitalisation as an opportunity | 0.124 | −0.082 | 0.684 | 0.274 | −0.006 | −0.005 | 0.080 | |
| Greater variety among workplace tasks due to digitalisation | 0.375 | −0.201 | 0.618 | −0.061 | −0.123 | 0.038 | −0.102 | |
| Digitalisation as workplace facilitator | 0.207 | −0.010 | 0.556 | −0.149 | 0.042 | −0.070 | 0.301 | |
| I am positive towards digitalisation | 0.174 | 0.052 | 0.457 | 0.328 | −0.087 | −0.038 | 0.105 | |
| Concerns and fears due to digitalisation | −0.046 | −0.004 | −0.114 | −0.819 | −0.080 | 0.055 | −0.028 | Worries and concerns: Thoughts and fears about digitalisation and the future role of medical secretaries |
| My profession is “threatened” by digitalisation | 0.045 | 0.023 | −0.374 | −0.697 | 0.036 | 0.077 | −0.125 | |
| Thoughts about the future professional role | −0.081 | −0.119 | 0.116 | −0.625 | 0.042 | 0.027 | 0.042 | |
| Digitalisation has changed my views on the profession | 0.019 | −0.012 | 0.230 | −0.458 | 0.079 | −0.026 | 0.100 | |
| The future is bright | 0.105 | 0.096 | 0.193 | 0.427 | 0.103 | 0.011 | −0.030 | |
| A promoting workplace climate regarding interprofessional collaboration | 0.015 | −0.159 | 0.062 | 0.042 | 0.905 | 0.011 | 0.200 | Workplace inclusion: To feel included and acknowledged at the workplace |
| To be included and acknowledged | 0.057 | 0.004 | 0.076 | −0.085 | 0.816 | 0.059 | −0.020 | |
| Workplace hierarchy | 0.014 | −0.151 | 0.251 | −0.125 | −0.589 | 0.103 | −0.071 | |
| Equality and inclusiveness among professions | 0.146 | 0.087 | 0.109 | −0.146 | 0.586 | −0.084 | 0.029 | |
| Expectations to have knowledge regarding digitalisation | 0.131 | 0.058 | 0.056 | −0.062 | −0.013 | 0.835 | 0.032 | Added responsibilities due to digitalisation: New functions of medical secretaries |
| Expectations of forwarding knowledge regarding digitalisation | −0.001 | 0.041 | 0.190 | −0.104 | −0.039 | 0.778 | −0.056 | |
| Digitalisation tasks as a burden | −0.049 | −0.236 | −0.035 | 0.121 | −0.043 | 0.383 | 0.271 | |
| Stress due to new tasks | −0.170 | −0.096 | 0.044 | 0.061 | 0.127 | 0.015 | 0.577 | Workday routines: Perceived stress and workplace routines |
| Workplace changes due to digitalisation | −0.028 | 0.161 | 0.180 | −0.260 | 0.004 | 0.132 | 0.403 | |
| Unchanged everyday work | 0.298 | 0.096 | −0.285 | −0.049 | 0.035 | 0.013 | 0.394 | |
| Eigenvalues | 11.612 | 3.223 | 2.689 | 2.079 | 1.546 | 1.316 | 1.003 | |
| Variance explained | 33.350 | 8.500 | 6.799 | 5.049 | 3.687 | 2.863 | 2.040 | |

**Table 4.** Spearman’s rank correlation coefficient analysis (Spearman’s rho)

| **Correlations (Spearman’s rho)** | | | | | |
|---|---|---|---|---|---|
| | **Factor 1** | **Factor 2** | **Factor 5** | | |
| Perceived health index | 0.298** | 0.325** | 0.384** | | |

**Correlation is significant at a 0.001 level

## DISCUSSION

The four categories identified through qualitative analysis are aligned with the seven-factor model. The category "Paving the way for digitalisation" relates to factors such as Digital Inclusiveness, Educational Aspects, and

Added Responsibilities due to digitalisation. The "Acknowledgement and Self-Empowerment" category correlates with Workplace Inclusion, while "Thoughts and Fears" align with Worries and Concerns, as well as Workday Routines. Finally, "Digitalisation as an Enabler" is connected to the Positive Impact of digitalisation.
Additionally, Digital Inclusiveness, Educational Aspects, and Workplace Inclusion were found to be linked with the Perceived Health Index. These factors, along with Workday Routines and the Positive Impact of Digitalisation, were also associated with the SOC index.
While correlation does not imply causation, it is reasonable to infer that a stronger sense of coherence might enable individuals to better manage work-related changes due to digitalisation. In terms of perceived health, the stress resulting from digitalisation may negatively affect health. However, these are only tentative inferences. The study highlights the presence of associations between various aspects of digitalisation and health, and future research should focus on determining the causality and mechanisms underlying these relationships.
The adjustments to new work tasks observed in this study align with previous research indicating that medical secretaries are expected to be technologically adept (Côté et al., 2005) and skilled in administration (Lambe et al., 2018). However, new healthcare technologies demand fresh skills and training (Pope and Turnbull, 2017). This is significant because job satisfaction and performance are essential to workplace well-being and happiness (Fisher, 2010).
The study found that a positive view of digitalisation correlated with health outcomes. Previous research has suggested that employee well-being plays a mediating role between health and digitalisation in workplace contexts (Sun et al., 2022). Moreover, collaboration among employees has been shown to improve health outcomes (Suter et al., 2012), and relevant information can assist in accepting new responsibilities associated with digitalisation (Gardner et al., 2010).
Feelings of inclusion were also associated with health, likely reflecting the positive effects of an inclusive workplace environment that fosters organizational commitment, job satisfaction, and individual empowerment, all of which contribute to better health outcomes (Groggins and Ryan, 2013; Hofhuis et al., 2012). Medical secretaries, although performing tasks perceived as routine and not always seen as knowledge-based (Barley, 1996), may feel invisible, particularly during periods of organizational change (Bergey et al., 2019). Previous studies suggest that engagement, involvement, and clear expectations can positively influence employee health (Tsuno et al., 2018), making it crucial to include employees in the process of technological change, including explanations of the rationale for the changes (Williams and Dickinson, 2010). Medical secretaries have historically had low participation in change processes, which may affect their health (Lamontagne et al., 2014).
Earlier studies also suggest that organizational changes, such as the increasing use of technology, require collaboration across all roles within healthcare (Bossen et al., 2014). Our findings reflect the idea that the integration of technology may disrupt traditional workflows, making collaboration more essential (Bergey et al., 2019; Bossen et al., 2014). Research has shown that job satisfaction tends to be higher in more closed hospital units compared to open ones (Khokher et al., 2009). Inter-employee collaboration, however, can help overcome digital exclusion and positively affect workplace health (Wissemann et al., 2022).
It has been proposed that administrative tasks could be shifted from healthcare professionals to medical secretaries without significant difficulties (De Maeseneer et al., 2019). Furthermore, medical secretaries may be expected to handle duties for which no one else is responsible, despite their critical role in ensuring the smooth functioning of the workplace (Medford, 2013). It is also suggested that medical secretaries often take on tasks beyond their usual scope, such as managing patient-related matters in addition to clinical work (Holten Møller and Vikkelsø, 2012). This finding is consistent with our study, where, despite playing a vital role in workplace processes, medical secretaries may not always receive adequate recognition.

## CONCLUSION

This study identified four categories representing medical secretaries' experiences with digitalisation through qualitative methods, which were further analyzed quantitatively, revealing seven underlying factors. The results indicate that while medical secretaries express concerns about the changes brought by digitalisation, they also recognize its potential benefits, such as increased efficiency and more varied and engaging tasks. Furthermore, an association was found between medical secretaries' experiences with digitalisation and their health. These findings suggest that effectively managing the digital transformation process is crucial, and that medical secretaries should be actively involved to ensure their professional contributions are recognized and utilized optimally. Additionally, acknowledging their professionalism is essential for affirming their role within the healthcare system.

### Practical Implications

The evolving roles and responsibilities of medical secretaries in dynamic healthcare environments should be closely examined by management to clarify their functions and ensure equal recognition alongside other healthcare roles. Moreover, medical secretaries, like all employees, should be provided with proper training to adapt to new technologies and tasks. This could be achieved by offering healthcare staff adequate information

and resources to cope with organizational changes, particularly in relation to digitalisation. Ensuring equal involvement of all staff members and adopting an integrative approach to the workforce is key to fostering a more inclusive workplace.

**Limitations and Suggestions for Further Research**

A limitation of the study may be the use of online interviews, which could prevent the observation of participants' body language and emotional cues (Cater, 2011). However, research has shown that online and face-to-face interviews can yield similar quality results (Cabaroglu et al., 2010; Deakin and Wakefield, 2014), and the online method is often more cost-effective (Cater, 2011).

It is also noted that conducting interviews with two researchers can provide more comprehensive data (Velardo and Elliott, 2021), but this study involved only one interviewer. Additionally, one participant took part in both the interviews and the quality café sessions, potentially influencing the information shared. The sample size for interviews followed the principle of saturation from grounded theory (Glaser and Strauss, 2006), and 20 interviews were deemed sufficient to reach data saturation, with limited new categories emerging (Hennink and Kaiser, 2022).

Regarding quantitative data, prior research suggests that online questionnaires may result in fewer responses compared to paper surveys (Lefever et al., 2007). However, online surveys are often preferred for their time and cost efficiency (Ebert et al., 2018). The response rate in this study was slightly above the average for online surveys (Wu et al., 2022). Using a questionnaire designed based on qualitative interview results can improve content validity (McKenna et al., 2004).

Future research should focus on the evolving needs of medical secretaries, examining aspects such as workplace climate, stress levels, overall well-being, and how digitalisation as an organizational change affects their professional roles in healthcare. Investigating the mechanisms behind the association between digitalisation and health would also be valuable for further understanding these dynamics.

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