

Article

Digitization in Everyday Nursing Care: A Vignette Study in German Hospitals

Lisa Korte ^{1*} and Sabine Bohnet-Joschko ²

¹ Chair of Management and Innovation in Health Care, Department of Management and Entrepreneurship, Faculty of Management, Economics and Society, Witten/Herdecke University, 58455 Witten, Germany; lisa.korte@uni-wh.de

² Chair of Management and Innovation in Health Care, Department of Management and Entrepreneurship, Faculty of Management, Economics and Society, Witten/Herdecke University, 58455 Witten, Germany; sabine.bohnet-joschko@uni-wh.de

* Correspondence: lisa.korte@uni-wh.de

Abstract: (1) Background: The usage of digital technologies in hospital nursing provides potential solutions to the shortage of qualified nurses and current pandemic challenges. The process involves changes and requires willingness to learn. In this respect, leaders can motivate nurses. Therefore, this vignette study examined which motives and values leaders must address in order to promote nurses' motivation to use different digital technologies. (2) Methods: We asked hospital nurses in an online vignette study to assess fictitious situations about the imminent introduction of a digital technology. The situations differed regarding the devices (*tablet/smart glasses*), addressed motives (*extrinsic/intrinsic*), and values (*efficiency/patient orientation*). (3) Results: We included 299 responses in the analysis. The *tablet* vignettes caused especially high motivation, more than the vignettes of the *smart glasses* ($Z = -6.653, p = <0.001$). The leader was more motivating when emphasizing *efficiency* rather than *patient orientation* ($Z = -2.995, p = 0.003$). The dataset did not give significant results regarding *extrinsic* and *intrinsic motives*. (4) Conclusions: The results suggest *efficiency* as a motive for using known digital technologies. Management actions can provide the structural framework and training so that responsible leaders can ensure their staff's engagement to also use unknown devices.

Keywords: digitization; digitalization; digital health; hospital; nursing; nurses; vignette experiment

1. Introduction

The impact of digitization on healthcare and health professionals, including nurses, is profound. The organization of the process involves comprehensive change management and the willingness to enhance competence among employees (1, 2). The current pandemic situation exposes these professionals to additional challenges (3). One-third of the staff in German hospitals are nurses (4). The potential for digitization here is high: information and communication technologies are already well established, and the conditions for continued technological development and research are set, especially in large university hospitals (5, 6). In order to obtain the benefits of digitization in hospital nursing, it is crucial to ensure nurses' engagement and motivation and to know more about their experience with different technologies (7, 8). Leaders have the chance to reach these personnel effects by addressing *intrinsic* and *extrinsic motives* (*IM* and *EM*), as well as important values in hospital nursing like *patient orientation* and *efficiency orientation* (*PO* and *EO*) (9-13).

Theoretical Framework and Hypotheses

With respect to the relevance of leaders' behavior and communication for their staff (14-16), the aim of this study was to examine how leaders can promote the implementation of digital technologies in hospital nursing. What motives and values can they address to

support nurses' motivation to use different digital innovations? We selected a *tablet (T)* as a classic device with a low degree of innovation and *smart glasses (SG)* as a future-oriented digital solution mainly existing in the research context. In this regard, we also examined which technology provides more motivation among the nurses. Based on a systematic literature research and interviews with experts, we developed the following hypotheses:

H1: *T* provides more motivation to use it than *SG*;

H2: *IM* provides more motivation to use digital innovations than *EM*;

H3: *PO* provides more motivation to use digital innovations than *EO*;

H4: The degree of innovation (*T/SG*) has a higher influence than values (*PO/EO*) and motives (*IM/EM*);

H5: Values (*PO/EO*) have stronger effects than motives (*IM/EM*).

2. Materials and Methods

2.1. Study and Questionnaire Design

We used an experimental vignette design to examine our hypotheses. The vignette methodology involves brief descriptions of a fictitious situation, which vary regarding specific factors (17, 18). The design is particularly suited for health and social research because it studies latent variables such as the attitudes, appraisals, and behavioral intentions of individuals regarding specific topics (18-22). The advantage of vignette analysis is the reduction in socially desirable responses by the experimental but realistic design of everyday situations (17). This ensures both internal and external validity (20, 23-25). In contrast to conventional survey research, vignette studies enable us to present several pieces of information simultaneously: the participants read a general situation and evaluate the individual items rather unconsciously. In the evaluation, the dimensions and their characteristics can be considered in total and separately (18).

We developed the content of our vignettes based on the literature (21, 26) and interviews with 15 nursing experts. These were nursing staff, leaders, and researchers. We optimized the survey in three pretests and finalized the wording through extensive discussion. In two initial situations, the fictitious nursing leader announced the imminent implementation of *T/SG* in the monthly team meeting. The questionnaire explained *SG* as they are not common in hospital nursing (5, 6, 27, 28).

In both basic vignettes (*T/SG*), the leader used four different combinations of motives and values for the announcement. In total, there were eight different vignettes. The terms "interesting activity" and "expansion of professional competencies and opportunities" represented *IM* and *EM* (29-33); "more time for individual patients" and "completing tasks more quickly" represented *PO* and *EO* (13, 34-38). We analyzed the participants' willingness to use digital technologies depending on the device's design, motives, and values, as well as the different combinations of these in the vignettes.

We conducted the vignette study via LimeSurvey, an academic online survey tool. It took the participants approximately 10 minutes to complete the survey. There were no inclusion criteria except for working as a nurse in a German hospital. Instead, we queried additional characteristics to specify and control influences within the respondent group. The survey started with the vignettes and added questions about the particular situation, sociodemographic data of the person, general willingness to use technology, professional background, job satisfaction, facility, and professional characteristics. Except for an open comment option at the end of the questionnaire, we specified all answer options, mainly by rating on a six-point Likert scale.

2.2. Recruitment

We distributed the online survey between 24 November 2021 and 20 January 2022. We spread the link in personal social networks, on social platforms, and via email distribution lists for related staff and experts with further connections. Several hospitals and networks of professionals also distributed the survey.

2.3. Data Processing and Statistical Analysis

We removed incomplete and erroneous questionnaires, such as those not filled out by hospital nurses. Since all crucial questions referred to non-sensitive and, therefore, mandatory data, there were no missing values. Other questions had answer options like "do not know" or "do not know exactly". We coded data in text format into numeric indicator variables.

We used two short scales on general willingness to use technology and job satisfaction from the compilation of social science items ("ZIS") of "GESIS - Leibniz Institute for Social Sciences e.V." (39, 40). The individual items were coded in the same directions in order to define a low willingness to use technology or low job satisfaction with low numbers. For both scales, we calculated new variables to indicate the average values. We categorized variables with many expressions like age in groups.

For the evaluation of each vignette, the data distribution was tested. Due to the non-normally distributed variables, we applied the Friedman test as a non-parametric test for the comparison of more than two dependent samples—in this case, the different vignettes. We used the same procedure for recalculated dependent variables in which we considered the individual dimensions and characteristics in isolation. In order to find differences in their influence on the dependent variable of motivation to use, we performed Dunn–Bonferroni tests as post hoc tests. For direct comparisons between two vignettes, we applied the Wilcoxon test for two connected samples. We conducted group comparisons, regression analyses, and correlation calculations to control the association between independent variables and the participants' willingness to use digital technologies.

3. Results

3.1. Sample—Respondent Characteristics

After removing 232 incomplete and 13 additional questionnaires according to the defined exclusion criteria, the complete data of 299 nurses remained. With a number of 229, three-quarters were female (76.6%), 69 persons were male (23.1%), and 1 person was non-binary (0.3%). The average age was 37 years. The youngest person was 18 and the oldest was 63 years old. The largest age group was the one from 20 to 29 years (31.8%). Most participants had a high school diploma ("Abitur") (37.5%) or a university degree (33.4%). One-quarter had a secondary school diploma ("Realschule") (27.3%). In total, 3% of the participants did not give any information about their education, and 0.7% stated a lower secondary school diploma ("Hauptschule") as their highest education level. Table 1 shows all respondent characteristics.

Table 1. Baseline characteristics of participants.

Variable	N (in total=299)
Gender	
Male	229 (76.6%)
Female	69 (23.1%)
Diverse	1 (0.3%)
Age (\bar{X}=37 years)	
Under 20 years	4 (1.3%)
20-29 years	95 (31.8%)
30-39 years	78 (26.1%)
40-49 years	59 (19.7%)
50-59 years	53 (17.7%)
Over 60 years	10 (3.3%)
Highest level of education	

Lower secondary school diploma	2 (0.7%)
Secondary school diploma	82 (27.4%)
General qualification for university entrance (Technical) College degree	112 (37.5%) 100 (33.4%)
Not specified	3 (1%)
Professional group	
Health care and nursing	240 (80.3%)
Health care and pediatric nursing	41 (13.7%)
Nursing assistance	3 (1%)
Geriatric nursing	5 (1.7%)
Academic nursing degree	69 (23.1%)
Education	8 (2.7%)
Other	9 (3%)
Specialization/further education	
Yes	65 (21.7%)
No	234 (60.9%)
General job satisfaction/technical readiness (\bar{X}=3.73/4.5)	
Very low (1)	1/0 (0.3/0%)
Low (2)	12/2 (4/0.7%)
Rather low (3)	115/24 (38.5/8%)
Rather high (4)	126/125 (42.1/41.8%)
High (5)	30/118 (10/39.5%)
Very high (6)	15/30 (5/10%)
Frequency of T/SG use (private) (\bar{X}=4.95/1.15)	
Never (1)	18/284 (6/95%)
Rarely (2)	30/1 (10/0.3%)
Sometimes (3)	17/4 (5.7/1.3%)
Often (4)	19/5 (6.4/1.7%)
Very often (5)	14/4 (4.7/1.3%)
Daily (6)	201/1 (67.2/0.3%)

3.1.1. Sample—Profession and Workplace

Overall, 80% of the participants were part of the general professional health care and nursing group. About 14% of the respondents worked specifically with children, 1% were nursing assistants, and 1.7% specialized in elderly care. Almost one-quarter of the respondents had an academic nursing degree (23.1%), while 2.7% of them were in training or studying. The sample distributed across various specialties. A high proportion (20.7%) of participants worked in intensive care medicine.

The average scope of employment was around 85%, with around 60% working full-time. Almost 22% had personnel responsibility. Nearly 60% of the people worked in large hospitals with at least 800 beds. The rest were distributed among smaller hospitals: 15% of the respondents worked in hospitals had fewer than 400 beds, and 20% worked in those with 400 to 800 beds. Almost 8% did not know the number of beds in their place of work. More than two-thirds of the respondents worked at hospitals under public ownership (71.2%). Nearly 20% worked at non-profit hospitals, and 5% worked at private institutions. Around 6% did not know the sponsorship situation of their place of work. Table 2 shows the most important data on the workplace.

Table 2. Baseline characteristics of the respondents' workplaces.

Variable	N (in total=299)
Sponsorship	
Public	213 (71.2%)
Non-profit/denominational	55 (18.4%)
Private	14 (4.7%)
Do not know exactly	17 (5.7%)
Number of beds	
Less than 100	6 (2%)
Less than 200	21 (7%)
Less than 300	6 (2%)

Less than 400	8 (2.7%)
Less than 500	22 (7.4%)
Less than 600	20 (6.7%)
Less than 700	11 (3.7%)
Less than 800	6 (2%)
800 or more	176 (58.9%)
Do not know exactly	23 (7.7%)
Degree of digitization hospital/specialty department (\bar{X}=3.46/3.36)	
Very low (1)	
Low (2)	26/34 (8.7/11.4%)
Rather low (3)	46/55 (15.4/18.4%)
Rather high (4)	75/71 (25.1/23.7%)
High (5)	82/65 (27.4/21.7%)
Very high (6)	57/57 (19.1/19.1%)
Presence of digital documentation (T or similar)	
Yes	13/17 (4.3/5.7%)
No	162 (54.2%)
Frequency of T/SG use (professional) (\bar{X}=3.01/1.09)	
Never (1)	
Rarely (2)	147/291 (49.2/97.3%)
Sometimes (3)	10/0 (3.3/0%)
Often (4)	16/2 (5.4/0.7%)
Very often (5)	21/3 (7/1%)
Daily (6)	29/2 (9.7/0.7%)
Gender of leader	
Male	76/1 (25.4/0.3%)
Female	182 (60.9%)
Age of leader (\bar{X}=47)	
20-29 years	117 (39.1%)
30-39 years	5 (1.7%)
40-49 years	56 (18.7%)
50-59 years	89 (29.8%)
Over 60 years	110 (36.8%)
Not specified	33 (11%)
	6 (2%)

3.1.2. Sample—Technology Readiness and Job Satisfaction

The average values for general willingness to use technology and general job satisfaction describe the following: Most participants had a more positive attitude towards technology. The mode and median were "rather high" (4). The mean value was 4.5. In total, the respondents selected the upper values (4 to 6) more frequently, which indicated a greater willingness to use technology (91.3%). Regarding the general job satisfaction, the situation was different. Although the median and mode were also 4, the mean value was only 3.73 because almost half of the respondents selected the three lower values (1 to 3) (Table 1).

3.1.3. Sample—Professional Motives and Values

We queried the general importance of the motives and values addressed in the vignettes at the end of the questionnaire. All characteristics (IM/EM/PO/EO) were important in everyday working life for most respondents. The median and mode were higher for IM and PO (6) than for EM and EO (5). PO recorded the highest mean value (5.68), followed by IM (5.42), EM (4.89), and EO (4.45). Table 3 shows an overview of these data.

Table 3. Importance of job characteristics for respondents.

Variable	Mean value	Median	Mode
Intrinsic motivation ("Interesting activities")	5.42	6	6
Extrinsic motivation ("Good opportunities for advancement")	4.89	5	5

Patient orientation ("Time for individual patients")	5.68	6	6
Efficiency orientation ("Quick completion of tasks")	4.45	6	5

3.2. Willingness to Use Digital Innovations in a Situational Context

Within the basic vignette T, the Friedman test did not prove any significant differences between the four combinations of motives and values in the leader's announcement. The mode for the two extrinsic T-vignettes was 3 and was thus a little lower than that for the intrinsic T-vignettes (4). The median of the combination T-EM-PO (3) was also lower than those for the other three T-vignettes (4) (Table 4). We also found no significant differences within the basic SG-vignette. The median for all four vignettes was 3, but the mode for the combination EM-PO was higher (4) compared to those of all others (3) (Tab. 4). We finally identified significant differences by analyzing the individual ratings in isolation via the Friedman test (Figure 1).

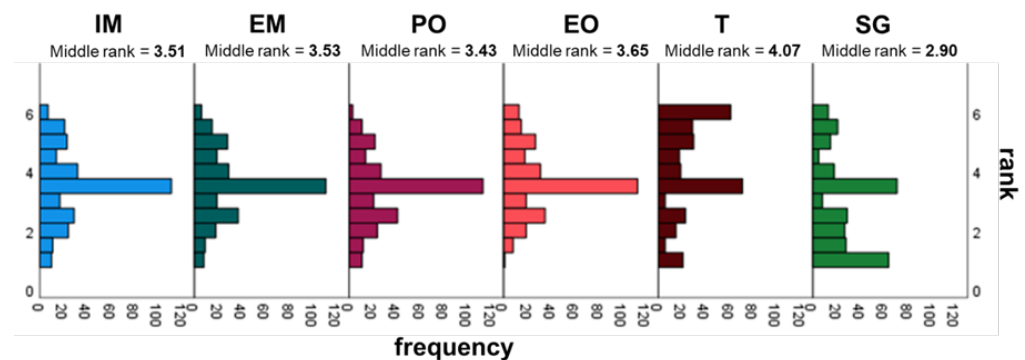


Figure 1. Two-factor variance analysis for ranks according to Friedman for isolated expressions.

By using post hoc tests, we measured the differences between T and SG. When comparing the two basic vignettes, it was obvious that the respondents selected the three lower evaluation levels (1 to 3) in the T-vignettes less frequently than in the SG-vignettes. Thus, by selecting the upper three levels (4 to 6), more than half of the participants were generally willing to use T in everyday work, while less than half of them showed this willingness regarding SG.

In the next step, the Wilcoxon test proved significant differences. By combining the four vignettes from each of the two initial situations (T and SG) and comparing these two "new" variables, significantly more participants felt addressed by T than by SG ($Z = -6.653$, $p = <0.001$). The effect size here was in the medium range ($r = 0.385$). T, as a technology with a low degree of innovation, was therefore associated with a higher willingness to use it than SG, supporting **H1**.

We also applied the Wilcoxon test for the other two dimensions. The results indicated no significant difference between all EM-vignettes and all IM-vignettes. We found a significant difference between the PO-vignettes and the EO-vignettes: EO increased the motivation to use digital innovations more than PO ($Z = -2.995$, $p = 0.003$), although the effect size was small ($r = 0.173$). We identified this significant difference in the characteristics of the value orientation specifically in the T-vignette ($Z = -2.182$, $p = 0.029$), but also with low effect size ($r = 0.126$). The medians of all individual expressions reflected these differences. They were mostly in the upper half of willingness to use (4). Those for the PO-vignettes and the SG-vignettes were in the lower half (3) (Table 4).

We only detected a significant difference within the motive dimension in the SG-vignette. Targeted pairwise analyses using the Wilcoxon test indicated significantly higher values for EM than for IM when we compared the combinations SG-IM-PO and

SG-EM-PO ($Z=-3.023$, $p=0.002$). However, the effect size was small ($r=0.16$). For this reason, we could not confirm the assumption in **H2** that IM stimulated the respondents more to use digital innovations than EM, even if the descriptive values of the T-vignettes initially suggested this. We also could not ultimately draw definite conclusions regarding the motives, since we found differences only in combination with the other dimensions and their expressions.

We were able to disprove the assumption from **H3**. EO triggered higher motivation than PO, albeit a slight difference. Overall, the dimension of the degree of innovation had the highest influence on the willingness of nursing staff to use new technology, followed by the value orientation, supporting **H4** and **H5**. Further analyses with combinations considered in isolation did not yield any new findings for all dimensions and characteristics.

Table 4. Vignette assessments—mean, mode, and median (individual and isolated per expression).

Variable	Mean value	Median	Mode
T-IM-PO	3.69	4	4
T-IM-EO	3.84	4	4
T-EM-PO	3.63	3	3
T-EM-EO	3.74	4	3
SG-IM-PO	3.08	3	3
SG-IM-EO	3.19	3	3
SG-EM-PO	3.29	3	4
SG-EM-EO	3.26	3	3
T in total	3.87	4	4
SG in total	3.30	3	4
IM in total	3.59	4	3
EM in total	3.61	4	4
PO in total	3.53	3	3
EO in total	3.66	4	3

Influence of Independent Variables

We used group comparisons, regression analyses, and correlation calculations to measure possible influences of independent variables on the participants' assessments of the eight vignettes. Five independent variables showed significant results across all vignettes. To measure the effect, we chose the vignette T-IM-EO, which had the highest ratings in our study. The higher the respondents' general willingness to use technology ($B=0.289$, $p<0.006$) and the level of digitization of the hospital ($B=0.215$, $p<0.011$), the more likely the nurses felt addressed by the leader's announcements in all vignettes.

We found an equally positive correlation regarding the importance of efficiency in everyday work: The more important the efficiency was to the participants, the higher their willingness was to use T and SG in the fictitious situations ($B=0.171$, $p<0.015$). The present use of similar digital documentation as with T had a negative influence on the dependent variables in the eight vignettes ($B=0.502$, $p<0.007$). We found another negative correlation between the vignettes and the work experience at the current workplace ($B=-0.037$, $p<0.004$). This means that the shorter the period of time for which the nursing staff had worked at their current workplace, the higher their motivation in the fictitious situations to use a new technology.

4. Discussion

In summary, this vignette study identified ways in which hospital nursing leaders can motivate their staff to use digital innovations. Based on the literature findings and interviews, we integrated features with high motivational potential into fictitious situations that 299 hospital nurses then evaluated. The comparison of two baseline situations indicated that the willingness to use T was higher than the willingness to use technologies with a higher degree of innovation, such as SG. Furthermore, the participants felt more

motivated when the fictitious leader emphasized *EO* instead of *PO* in the announcement. With regard to the type of motivation, there did not seem to be significant differences between *IM* and *EM*. Thus, there was no "best" constellation presented.

However, there was a high general willingness to use technology among a large proportion of respondents. The optional final comments in the survey reflected this: In contrast to findings in the literature, there was no general rejection of digitization in everyday work (41). Most nurses were aware of the need to expand their competences due to the process changes, whereby they saw digitization as a supportive opportunity in their work. They expected process optimization, especially in digital documentation, because they could access and exchange data quickly. This confirmed the importance of *EO* for the participants and their assessments, especially in the *T*-vignettes.

The fact that many systems and products are not user-friendly or do not function properly was seen as critical. This was associated with additional work and disadvantages for the care itself and the patients. At best, digitization was associated with faster documentation and multiprofessional exchange, but barely with more time for patients. This may also explain why the respondents selected comparatively low values for the *PO*-vignettes. For the nursing staff, there was probably no connection between *PO* and digitization anyway. That is why the respondents did not perceive this value orientation as motivating in the vignettes. However, *PO* provided significant value for nurses, as also confirmed in the survey.

Another explanation is that *EO* is crucial, especially in the context of digitization. A nursing staff that experiences productivity and a good workflow is more satisfied and engaged, and vice versa (16, 42, 43). Accordingly, *PO* and high-quality care for patients are only possible by working efficiently (1, 44). Without features such as efficiency and structure, the daily work routine becomes chaotic. Leaders in hospital nursing must focus on these factors in order to reduce the burden experienced by their staff and support their commitment and willingness to learn, especially in current pandemic times and to face constant changes and innovations (3, 45, 46).

The negative influence of the existence of comparable digital patient documentation supports the assumption that the type of digitization that has existed so far does not work without disruptions and that there is a lack of training and support. More years of work in the current workplace also correlated with less motivation to use *T* and *SG*. The negative experiences could outweigh the positive ones, and general poor working conditions lead to dissatisfaction of the nursing staff and, therefore, to less engagement and motivation. The experienced disadvantages and the frequently reported low job satisfaction supported this (47-49).

A further explanation for the higher motivation in the *T*-vignette is the association with *efficiency*: Disregarding the negative influences, *tablets* are known technologies that might not require as much training effort as the *smart glasses*. A potential problem of the *SG*-vignette could be the distance from reality and from being part of everyday practice. The lack of motivation of the nursing staff did not have to be primarily due to the technology itself. Its supportive, flawless use is still unrealistic, as the final comments of the participants confirmed. The nurses maybe could not see any work facilitation by using *SG*, which is why *EO* did not motivate them in the *SG*-vignettes.

In addition, many people prioritize their private life and personal issues over their working life. The change of culture and values can therefore be another reason for striving for as much efficiency at work as possible, so that the nurses can achieve a good work/life balance. The respondent group is young, is well-educated, and attaches much importance to their own well-being and personal aims. Regarding *PO* in the *SG*-vignettes, the respondents did not perceive any connection to *PO*. They perceived the idea of *SG* as a product within the interaction between nurses and patients as being disruptive to interpersonal communication. A possible explanation for the slightly higher motivation regarding *EM* in the *SG*-vignettes could be a perceived pressure to use. This may also have been a coincidence or a consequence of the complex vignette query.

Finally, nurses see high potential in digitization to facilitate work processes. They still cannot reconcile their hopes and certainly existing acceptance with what has not yet succeeded in German hospitals (50). The independent query on the importance of the motives and values at the end of the survey indicated the generally high importance of the expressions (*IM/EM/PO/EO*) in hospital nursing. The respondents classified *PO* as most important, while this had comparatively low ratings in the vignettes. This suggests that the expressions were either not visible in the vignette formulation or that *PO* was simply not perceived as an advantage of using digital innovations in hospital nursing. Likewise, the independent query might have been influenced by social desirability, which was avoided in the vignette query.

Responsible leaders should reflect the examined characteristics (*IM/EM/PO/EO*) in their behavior. In the context of digitization, however, there are far more problems that need to be fixed. These do not just relate to the staff, but are primarily of a structural and organizational nature (51). Leadership behavior remains influential (10, 52). Those who are responsible on the entire management and health policy levels must initiate the framework conditions. The general conditions, such as the shortage of skilled nurses and pandemic-related additional burdens, also have an influence on the motivation of nursing staff, as reflected by the respondents' moderate assessments of general job satisfaction. This induces a need for comprehensive action to ensure willingness to learn and adapt, commitment, and, subsequently, high performance in nursing staff (3, 48, 49, 53).

Limitations

Despite significant differences, it is possible that respondents could not clearly distinguish and rate the vignettes. The frequent ratings of the medium levels (3 and 4) on the Likert scales support this assumption. Considering the dependent variable of willingness to use *T* and *SG*, a question with only "yes" and "no" as answer options could have generated pressure to make a decision and lead to rather negative evaluations. Even though we tested the content and wording for the dimensions and their expressions, understanding and interpretation were not always the same, and respondents focused on different concepts. Otherwise, the combination of different characteristics in a general situation is the special character of the vignette design.

It is difficult to assess whether entirely different dimensions or a different wording for the expressions would have been better. More situational features in the vignettes would have increased the complexity and thus reduced the respondents' attention or even the overall response rate. Even though we collected many other factors influencing the motivation to use digital innovations in hospital care in the questionnaire, it is not possible to cover all influencing factors. Attitudes towards digitization are a causally multifaceted phenomenon, which is why our own survey could only explain a part of the willingness to use.

The higher proportion of female respondents in the sample gave the representativeness of the sample with regard to gender (54). Limitations exist due to the random sample of respondents. Recruitment via social and digital media led to self-selectivity in participation. The sample featured a young and educated group. The analysis therefore controlled for the influences of such respondent characteristics, but no significant effects on vignette ratings were found. The control for the number of beds, for which just half of the respondents stated 800 or more, also did not have a significant effect. The results are not representative for all German hospitals and their nursing staff, but this is not the prior aim in qualitative research.

Finally, the external validity is limited, especially with regard to *SG*. Due to the participants' possible lack of imagination, it was difficult for them to assess their behavioral intentions in the vignettes. Although the vignettes describe fictitious situations and inquire hypothetically about behavior, closeness to reality is still necessary. This seemed to be easier with the *T*-vignettes. About half of the surveyed nurses already used this or a comparable technology in their everyday working lives; even more did so in their private

lives. The selected technologies may not have been representative for the dimension of the degree of innovation and were associated with other, too-different usage characteristics. Whether the ratings ultimately match behavior in a similar real-world situation remains open. The effect sizes in the statistical analysis were low to medium, but this is common in experimental designs.

5. Conclusions

Overall, the participants of our survey assessed the vignettes differently. The product design and degree of innovation had the biggest influence: the willingness to use was significantly higher for *T* than for *SG*. Even if the motives *IM* and *EM*, as well as the values *EO* and *PO*, played a role in the work behavior of nurses, they were less relevant in the context of digitization. *EO* seemed to be at least more of an incentive to use digital innovations in everyday work than *PO*. Despite controlling for various influencing variables, the query was very complex, and we could not exclusively apply the results to general practice. However, they suggest the relevance of specific leadership characteristics and personnel communication at the micro level. General conditions must be provided through actions taken at the structural and organizational macro level in order to inspire leaders, create new roles, and achieve personnel development.

The qualitative results of the open comments in the end of the questionnaire made it possible to identify areas that potentially require action. Investment in individual training, constant support, and functional systems are crucial, as acceptance and willingness to use technology were generally present among nursing staff. Products that seem unrealistic and unknown should not just be addressed in theory, but should find ways into everyday practice so that health professionals become familiar with these (1, 45). Taking into account the physical and psychological stresses on nursing staff that are increasing due to the pandemic, the results highlight the relevance of change management and leadership-related urgency to maintain commitment and motivation among hospital nurses (3, 53).

Supplementary Materials: The data presented in this study are available on request from the corresponding author.

Author Contributions: LK prepared and designed the vignette study. SBJ has made important contributions to the design of the work. LK recruited a major part of the participants; SBJ supported the recruitment in her professional environment. LK analyzed and interpreted the data regarding the vignettes and further influencing factors. LK was a major contributor in writing the manuscript. SBJ has substantively revised the manuscript. Both authors read and have approved the submitted version.

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Institutional Review Board Statement: Ethical review and approval were waived for this study, due to the anonymous and voluntary participation without any vulnerable content and consequences for the nurses.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The datasets used and/or analyzed in the context of this study are available from the corresponding author on reasonable request.

Acknowledgments: Not applicable.

Conflicts of Interest: The authors declare no conflict of interest.

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