

HEALTHCARE WORKERS AND TECHNOLOGICAL CHANGE INTERVIEW PROJECT REPORT

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PROJECT SUMMARY

This project was developed through a partnership between the United Steelworkers Tony Mazzocchi Center (USWTMC) and the United Steelworkers Health Care Workers Council (USW HCWC).

This project's aim was to better understand USW healthcare members' concerns with technological changes and how these changes are affecting healthcare jobs and work environments. The information from this project will be used to inform planning for future activities, including the development of safety and health curricula for members in the Health Care Workers Council.

Twelve USW healthcare members and leaders participated in interviews in December 2021 and January 2022. These interviews expanded on insights gained from an earlier 2021 online survey. Information on the project design is provided at the end of this report.

Key findings

Throughout the interviews, a common concern expressed by healthcare workers was about the impact of technological change on their patients and patient care, as much as on themselves. The full report groups participant concerns into the following areas, providing many examples – often in the words of the members.

1. Problems with technologies

Participants described numerous functional issues with technologies not working as intended. These issues related to troubleshooting and maintenance of technologies; and issues related to inadequate technologies. One example, in the pharmacy setting, was a pill counter machine that was not consistently accurate, printed smudged labels, and became stuck or jammed.

2. Negative consequences of technology implementation

Participants described the negative consequences of technology implementation on patient care, job security, staffing levels, workload, and health and safety. An example related to staffing levels and workload was employer pressure and the threat of discipline of customer service representatives based on call statistics only. Customer service representatives take calls from members who have experienced devastating losses such as miscarriage, a family member's suicide and during the Covid-19 pandemic, individuals trying to locate dying family members so that they could say goodbye.

3. Strategies to consider when addressing the introduction of technologies

Participants provided examples of healthcare workers and local unions voicing concerns and advocating for changes related to these issues. Strategies described included working with the Health and Safety Committee, engaging management (including direct supervisors, department heads, and hospital leadership), submitting information requests, bringing issues up in union contract negotiations, filing grievances, contacting the state to report violations, opening tickets with the IT department, and engaging in legislative advocacy.

Key recommendations

Recommendations to address the negative impacts of technologies on healthcare workers are provided at the end of this report. These are some key recommendations.

To address the negative impacts of technologies on healthcare workers, possible strategies to consider are as follows:

1. Worker Involvement

- Disseminate information about user-centered design, an approach that includes workers' voices in the entire process of technology design and development.
- To promote transparency and effective communication, map organizational information flows, technology processes, and decision-making chains in each hospital and health system.
- Identify stakeholders with an interest in effectively utilizing technologies, and assess the potential for hospital-wide or system-wide changes. In addition to workers, these should include technology vendors, developers, and corporate-level employees and decision-makers.
- Identify and promote strategies for meaningful institutional change to reduce healthcare worker job stress and support mental health. These should include system-wide interventions and commitments.

2. Training and Support

- Develop trainings requested by affected workers and promote quality improvements to internal health system trainings.
- Develop adequate support systems for workers experiencing technical issues with new technologies. Some strategies could deploying Superusers, offering end user support groups, and having representatives of technology vendors on-site to address issues.
- Educate health system leadership on the negative consequences of poorly executed technology implementation, including the impacts to company priorities such as patient care, high quality service, efficiency, and affordability.

3. Research

- Conduct research on specific technologies and health issues identified by affected workers.
- Conduct research into legislation and enforcement mechanisms designed to ensure adequate staffing in different states. Compile strategies from healthcare workers who have advocated for adequate staffing levels and support worker efforts to address systemic staffing inadequacy.
- Compile strategies from healthcare workers in departments and health systems that have effectively integrated technologies and share them among other departments and health systems.

FINDINGS

1. Problems with technologies

Participants described numerous functional issues with technologies not working as intended; issues related to troubleshooting and maintenance of technologies; and issues related to inadequate technologies.

Functional issues with technologies

Workers described a number of functional issues with technologies—problems that occur when the technologies are not working as intended. For example, a speech-to-text program, Dragon, was rolled back in one health system because the software did not recognize medical terminology, leading to errors. The health system is planning to reintroduce this program.

In the pharmacy setting, functional issues reported included the pill counter machine, a Kirby Lester, not being consistently accurate, printing smudged labels, and getting stuck or jammed. A medication delivery app is causing errors in the amount charged to the patient, while Moby, the program used to order medications, “75% of the time doesn’t work properly.”

A nurse reported a high level of redundancy in electronic charting, although the health system is on the verge of changing to another electronic medical record (EMR) platform, which may or may not have the same issue. Furthermore, the current EMR platform appears to not be optimized and streamlined for the workflow and work setting: “It’s not a fluid screen; you have to jump to certain screens—if I have to make a note, I’ve gotta come out of the system I’m in and go into another system if I call the doctor and have to make a note on that.” This participant emphasized the time-consuming nature of using EMR as compared with paper charting. Glitches, like a frozen computer, further add to the time spent on charting.

Another participant shared that when the EMR system goes down, work would actually cease altogether for the radiologic technologists. They could not operate the X-ray equipment while the system was down, and had no way to override the system.

Considerable issues were reported in the customer service setting, which is highly reliant on technologies for all job duties since customer support is provided via phone and computer systems. The technology system containing the coding and chart information is very slow, which adds to the workload. Further, as new products and systems are introduced, technical issues constantly arise. “Even though [the systems are new], they are supposed to be faster, but they are more problematic,” shared one worker, who described issues ranging from the application causing calls to disconnect, to an entire work station being down for the day. A new system for appointment scheduling has led to myriad errors. One participant shared, “There are constantly new workarounds each week as calls are identified.” Recently, the company developed a QR code that was supposed to direct patients to their Covid-19 test results, but the code did not work.

Medical devices can also show functional issues; for example, one participant shared about a new device to measure patients’ oxygenation levels that was shown to be less effective in individuals with darker skin tones, raising serious concerns about safety and quality of care for many patients of color. The participant raised this concern to the technology vendor, which had developed a different attachment for the device that addressed the identified issue. However, the example shows how problems with technologies can have major implications for racial inequities in health outcomes.

Troubleshooting and maintenance

When functional issues arise, how they are addressed is another area of concern, and a core issue that participants identified as significantly contributing to the negative impact of technologies on their work. When technologies have been integrated into the workflow and those technologies stop functioning, work is interrupted, and employees must then spend time fixing the issue, reaching out for support, and/or developing workarounds. All of these activities add to the workload and cause stress, particularly when staffing is inadequate:

Whatever the new technology is, if it's Epic, which is our EMR, when you have a glitch and it's down, then it turns into just a cluster for that day. Do we have enough staff to handle—because we don't, we're down to bare bones for staffing, so now we have a situation where Epic is down for the day and now everyone's scrambling trying to figure out how we're going to get patients registered, how we're going to get appointments scheduled, how everything's going to work. So that puts on a lot of stress to those workers who are on-site, dealing with a system that does not work for that day or multiple days.

When asked if there is a system in place for troubleshooting, fixing, and improving technologies, the participant replied, "I don't know that there's really been, I think it's literally – figure it out that day. There's not really truly a system in place; it's just deal with it." In this hospital system, there is a help desk for technical support, but wait times typically range from 20 minutes to an hour on a normal day. A nurse from another hospital system also reported a 20-minute hold time for troubleshooting, but "you don't have 20 minutes to stay on hold to fix the problem."

Likewise, the pharmacy technician shared that when the technologies aren't working, the workers are the ones who must maintain and fix them, adding to the workload. This individual actually transferred to a new position in large part because of the technological issues:

What happened to me -- the pharmacy I worked at for 9 years...I wound up just transferring to a new position. There were issues with the technology leading to issues with the nurses, boss, employees, everybody, all stemming from employees' technology. ... The problem was stemming from the ordering system that they implemented to order medications for different clinics in the building. We call it Moby; other people call it Willow. Where I am now it's the same, but there's a lot more support, a lot more help.

This comment indicates the importance of adequate support systems for workers experiencing technical issues.

Based on their experiences, participants anticipated similar issues with technologies that will soon be implemented. In one health system that is in the process of introducing robots to long-term care facilities, a participant shared, "The one challenge I foresee is just like with your electronic medical records, what if it goes down—we have to be able to have a system, or who's going to be maintaining that robot, if something breaks down, [or] the battery goes..."

A worker in customer service identified the systems in place to improve and update the technologies as being at the core of the issue, because the workers that use the technologies are not consulted:

We have voiced our opinions. We have learned to open tickets, specifically from our IT department. ... That helps us a lot. We let the company know: this process, the application is not working and this is why. They use not the frontline worker to test the system; they use, I am thinking, a vendor, or subject matter experts. But they don't take the calls, so how are they the experts? How would you know what members want or how to use the system? It disturbs us, because they don't ask *us* - how do we make this better for you and for the members?

One key aspect to the technology-related problems, then, is the disconnect between those working to improve the technologies and the end users – the healthcare workers themselves. Another participant added that companies are also not incorporating patient/customer feedback into technology improvements.

In a different health system, a nurse shared that in the past, with the initial introduction of EMR, monthly meetings were held to address staff concerns with the new technologies. Staff were not involved in the initial development of the system, but were included as it was developed and improved, and the company leadership was receptive to changes. With the new EMR platform that is about to be introduced, it is unclear if similar arrangements will be made for worker input.

Two participants mentioned a helpful practice for resolving technical support issues that includes healthcare workers familiar with the day-to-day use of technologies. As described by participants, Superusers are staff members who receive additional technology training and can be called to help their coworkers when technical issues arise. Another helpful practice mentioned was to have staff from technology vendors on-site.

Even when support systems are in place, constantly reaching out for support can be exhausting, as the pharmacy technician explained:

There is support available when it comes to the troubleshooting, but at a certain point you get tired of relying on the support. You get burnt out trying to get the support rather just have it work smoothly and cleanly once in a while, because the support is stretched thin when everybody's trying to reach out. Email, send a message, or call, leave a voicemail—there are different options but the support is stretched thin and we get tired of reaching out for support. We're taking care of a lot, a lot of sick patients and these days you need that top-of-the-line, A+ technologies to not have to always rely on the support. A lot of the time when I was reaching out for support I wasn't getting it.

In sum, access to adequate technical support will not resolve the issues affecting workers in itself, when the issues with technologies are so widespread and systematic. Healthcare workers need technologies to function well in the first place.

Inadequate technologies

While numerous issues were raised regarding new technologies, some participants reported issues with outdated or understocked technology systems and devices. The pharmacy technician particularly emphasized this issue. Outdated technologies are inefficient and frustrating to use, leading to increased workload and impacts on patient care:

Also...in the pharmacy we deal with a lot of different benefits issues, government-issued benefits and all that, and the system that they give us to check the benefits, it's the same system we use for clocking in and out, is honestly from the early 1980s. There's a couple things in the pharmacy that stem from the late '70s and early '80s and [the company] is choosing to stick with it. You're on the computer but it's like you're on a typewriter. There's no delete; there's no touch screen. It's amazing anyone would still be operating with that kind of things and all that kind of things affects us and affects patient care. ... With the pandemic, if we're going to keep up with that kind of thing, we need modern communication devices. ... The new technologies double or triple [my workload], really I would say so - just because with the old technology and the new existing at the same time, that makes us as the workers have to work double or triply hard just to work with each other, which is really hard. [The old and new technologies] are not synced like things should be today.

This last comment is important in its insight that outdated technologies add to the workload not only by being inefficient in themselves, but also by creating additional inefficiencies when they do not integrate well with newer technologies.

Even when new systems are introduced, the technologies given to the workers to implement them are often not new:

They come in and say, “This is it,” and we all just roll our eyes because we know it will be new to use, but at least 5 or 6 years behind what the new technology is. The patient information system is maybe from 2007 – it was cutting edge at that time. And that is blended in with old, old stuff trying to implement some of the new. It’s almost like DoorDash and stuff, [the company] has that kind of thing set up, so brand new technology with 10- to 15-year-old technology and 30- to 40-year-old technology. It’s unbelievable really.

With the Covid-19 pandemic, a curbside pickup system was created, but the phone that staff were provided to administer the system was a clunky cell phone that appeared to the participant to be about 20 years old. The pharmacy technician commented, “It’s the year 2020 and a big healthcare giant should be able to maybe be ahead on the cutting edge rather than 20 years behind.”

A customer service representative described a similar issue with large, outdated phones in the call center and small screens that were difficult to use. However, she reported that these were updated about 4 years prior, and that she was satisfied with the new technology, which includes new phones and two screens that are helpful for staff to toggle between the different views needed for their work.

In other cases, the technology being used is simply not efficient or appropriate for the task at hand. A nurse described how a phone system is used to order food for the patients, and nurses have to wait on hold for 15 minutes to call in the orders. She suggested that a computer system to take the dietary orders instead would be much faster.

Other issues arise when the technology is right, but there are not enough devices. The nurse who spoke favorably of barcode scanners also reported that some hospital floors do not have enough scanners to cover the number of patient beds.

The endoscopy technician mentioned a new technology called RFID (radio frequency identification) that will scan and track the scopes used in the department’s procedures. The devices are in the process of being rolled out, and the participant anticipates it will reduce stress for workers. However, the lack of technology up to this point has caused stress by requiring a high level of manual documentation in the computer system.

2. Negative consequences of technology implementation

The negative consequences of technology implementation on healthcare workers include impacts to patient care, job security, staffing levels, workload, and health and safety.

Impacts to patient care

Interview participants expressed deep concern about the impact of technologies on patient care. For one, time spent engaging with technologies reduces the time spent face-to-face with the patient. When technologies malfunction and workers must fix them or obtain support, direct care activities are also reduced or delayed.

In the case of EMR, one nurse emphasized that the increased time spent charting, as compared to when paper records were used, takes the nurses’ time away from patient care. She also commented on the potential impacts to safety. On a neuroscience and stroke floor, patient falls tend to occur frequently, yet nurses are stuck at the computer charting rather than making rounds on the patients.

The use of robots raised serious concerns as well. In the behavioral health setting, patients experiencing behavioral issues or suicidality were continuously monitored by staff. That role has now been replaced with robots as a cost-saving measure, leading to a clear potential for the patient’s wellbeing and safety to be jeopardized. Inadequate staffing contributes further to the problem. When a patient pushes a button, or the CNA monitoring the screens sees an

issue and calls the nurse, oftentimes no staff member is available. Fall risk was specifically mentioned in this context as well.

In the long-term care setting, where robots are expected to be implemented this year, a participant expressed concerns about the quality of care that can be provided by a machine as compared to a human being: “What’s going to happen to these residents when they don’t have that one-on-one? We just really feel it’s important that they have a person in that room talking to them.” She was particularly concerned about how patients experiencing cognitive decline or mental illness would react to having a robot in the room. Again, the negative impact could be compounded by inadequate staffing:

[Management is] not looking at the bigger picture of how does that individual who has Sundowner’s or who has schizophrenia or dementia going to be seeing this robot who is going to be staring at this individual while you’re running around doing God knows what with less staff and then all of a sudden the robot goes. The robot’s supposed to be there with another staff member so now we’re picking up, doing more with less. It’s scary the way we’re seeing our healthcare facility going now.

Errors caused by technologies can also create risks for patient care, as with the example mentioned of the speech-to-text program that inserts incorrect words to doctors’ notes.

Patient care issues also arise in nonclinical areas of the healthcare setting. Registration kiosks can create delays and frustration when a patient is unfamiliar with the technology or has issues using it, and no one is there to assist. In one health system, company efforts to reduce patient communications has negatively impacted patient care in the customer service area. Customer service staff are pushed to tell members to “self serve” through the company websites. This change leads to lower quality service since many people prefer assistance from a person, rather than “pushing buttons.” One participant shared:

The biggest concern, especially over the past 2 years with the pandemic, [has been the company trying to] reduce member interaction with us, to lessen call volumes, emails, trying to figure out different alternatives and methods of contacts to reduce those communications. You would think with the pandemic, [they would want more] member contact, but they are trying to take that piece away. They say they are big on service, but the company is not really thinking about the member, the member needs, but is really focused on the bottom dollar and what they consider affordability as they implement changes. It is really causing a negative member impact; members are becoming very upset. ... [And] we [the staff] are not giving the tools and resources to help the members.

This comment highlights the contradiction between the company’s stated values and the actual impacts of technology integration on its customers. Inadequate staffing worsens the quality of service in this area as well; currently, the representative reports a 2-hour hold time to get through to the customer service department, leading to anger and frustration for callers.

Participants report that these changes particularly affect older adults, who are often less comfortable using technology, but also tend to need more care. This impact was mentioned in both customer service and pharmacy settings. In the customer service setting, a participant reported getting “docked points” for not promoting the website when talking to an older adult who expressed that they do not use a computer.

A new appointment scheduling system has had significant negative impacts on customer service. Previously, appointments could be scheduled either through the company website or by calling the appointment center. Now, “the company wanted the member to do everything themselves, and to take away the part that the agents would be doing.” The new system for members to schedule through the website is not user-friendly and makes it difficult for the member to schedule the appointment they are actually seeking. Call volume has therefore increased. The platform used by the staff representatives was updated to match the new customer platform, but since worker input was not incorporated

and testing was not completed, it is complicated to use, rife with errors, and reduces the ability of the worker to successfully schedule the appropriate appointment for the customer.

Job Security

Technologies that have been introduced in the healthcare setting have led to job security issues, including layoffs, reassignments, and job combinations. Participants reported that in past years, job loss occurred for medical records staff with the initial introduction of EMR in the early 2000s. In another example, estimated to have occurred 20 to 25 years ago, the technicians who checked babies' hearing were offered a different unit position when a new device was introduced, as "it's cheaper to go to a subcontractor."

More recently, the introduction of kiosks led to the elimination of registration staff. One participant reported that some receptionists were transferred to the pharmacy setting. With the widespread implementation of telemedicine due to the Covid-19 pandemic, job loss for nurses occurred, including LPNs and CNAs. Another anticipated impact on jobs is expected to occur with the implementation of Dragon speech-to-text program, which will eliminate the transcriptionist position.

Concerns were also raised related to robots. As robots have been introduced into behavioral health settings, workers in the behavioral health technician role have been reassigned. In the long-term care setting, participants reported that robots are expected to replace CNAs and possibly LPNs when they are introduced into nursing homes in 2022. Another participant shared that robots will be introduced into a new hospital facility under construction, and may impact dietary, housekeeping, and environmental services staff.

Finally, one participant noted that the technological changes are leading to job loss not only through layoffs and reassignments, but also through attrition or the combining of two or more job titles into one.

Job security appears to be a concern for healthcare workers in some settings and job roles more than others. A customer service representative expressed that she did not fear the loss of her job over the next 10 years. Likewise, a hospital nurse did not report any observed job loss (except possibly the employees from the current technology vendor when the EMR system is updated). Hence, this issue may vary from company to company.

Inadequate staffing

Inadequate staffing is widely recognized as a critical issue in the healthcare field. In the interviews, workers pointed to how staffing levels are directly linked to the introduction of technologies. In regard to the speech-to-text technology and its impact on transcriptionist jobs, one participant implied that technological advances are being utilized by employers to institutionalize inadequate staffing levels in the healthcare environment:

Years ago, eliminating all of the transcriptionists and release of information staff was one of the employer's main objectives in negotiations. They wanted to outsource the transcription. The union was able to keep all those jobs—a significant amount. Eliminating transcriptionists has been on their agenda for a while.

Two similar examples were reported in the context of the long-term care setting. Prior to the implementation of EMR, the nursing staff on the floor at one participant's facility included an RN and an LPN, but with the introduction of EMR, the RN was removed. Likewise, prior to the introduction of ceiling lifts, two staff members were needed to transfer patients, but with the new technology, that number was reduced to one. As a result, two CNAs were removed from the floor. These changes significantly impact the workload for the remaining staff members.

As one participant noted, short staffing impacts patient care as well, by increasing the likelihood of making a medication error or the wrong choice of care.

Increased workload

Several examples of how technologies can increase workload for healthcare have been mentioned in the above sections. These include: slow, inefficient, or nonfunctioning technologies delaying the completion of work tasks; employees taking extra time to obtain and wait for technical support; and employees taking extra time to maintain technologies themselves and integrate poorly synced systems. Technology use can also add additional or redundant work, as with EMR. In another example, the endoscopy technician noted that the new process to ensure that scopes are disinfected, while improving patient safety, also adds work for staff. One participant also noted that time spent learning new technologies on-the-job, over and above the existing workload, is another challenge. Finally, as mentioned, inadequate staffing contributes to an increased workload as well.

Health and Safety

i. Job-related Stress

Job-related stress is a critical issue for healthcare workers that is exacerbated by technological changes. Technologies contribute to worker stress in the healthcare setting by means of the issues described above: they create barriers and delays to staff's daily work, which is already stressful in itself; they cause frustration when workers must attend to technical issues, oftentimes without adequate support; they increase workload; and they compromise patient care. In the words of one participant:

The stress - it's intense, the stress level is high. If you don't have the proper support and the proper technology, it just makes things a lot harder. And that just raises the stress level and that affects my health, it affects others people's health and then we're not here to take care of the patients that are already sick, and that's patient safety and employee safety.

Inadequate staffing is linked to technology implementation and significantly contributes to healthcare worker job stress. In addition, one participant mentioned that the challenge of adjusting to a new technology system, as with the switch to a new EMR platform, can add stress, particularly for older nurses. Furthermore, nurses in this system will be required to attend two days of training over and above their regular schedule, and vacation days are being blocked or limited during the time period when the trainings will occur.

Nonclinical staff, including customer service representatives, are also experiencing major stressors. Problems with the technologies contribute to worker stress both directly and indirectly. For one, the constant stream of technical issues create frustration for both the worker and the customer. Frustrated and angry customers, along with the failure of the company to effectively address technical issues and errors, further add to the employee's stress. "Members [are] constantly yelling at them and they can't fix anything," shared the grievance representative. Furthermore, problems with technologies such as the new appointment system only lead to increased call volume, but management has responded by requiring employees to complete more calls in less time—3 minutes per call. The grievance representative described the impossible demands being placed on nonclinical staff members:

Staffing issues are challenging right now in health care, and when it comes to the clerical positions you do need to have experience. They are *not* backfilling it in the name of affordability but not because they *can't* backfill, and that's where this pressure comes in: "Hey, you need to do it faster." One of the call centers easily receives over 100 million phone calls a year. If you do the math, there is no way you can do every phone call in under 3 minutes.

This comment reveals how the unreasonable pressures being put on employees can be linked to employer staffing policies. Participants described these pressures and the threat of discipline based on the employee's call statistics as another major stressor. The environment is so stressful that many representatives are taking leaves of

absence due to the impacts on their mental health. Others who have worked at the organization for up to 25 years are quitting their jobs.

Another stressor for customer service representatives results from taking calls from members who have experienced devastating losses such as miscarriage or a family member's suicide. During the Covid-19 pandemic, employees received calls from individuals trying to locate dying family members so that they could say goodbye. The nature of these calls along with the sheer volume of the calls deeply affects employee mental health, but participants reported that the company is not responding appropriately.

Workers in other health systems also identified unfair discipline of workers as an issue. The pharmacy technician, who reported that the technology issues ultimately led him to move to a new position, shared that "when things were not working out they were pointing the finger at me." The feedback from workers suggests that issues with technologies are systematic, yet employers are placing the blame on the individual employees. Another participant mentioned a worker who was terminated due to a technology error, though the union was able to assist him in regaining his employment through an arbitration process. In addition, a nurse brought up the issue of employees being disciplined for going into their own electronic chart through the employee portal rather than the patient portal, which is slow to be updated. Workers have challenged the hospital on this regulation, but were told that it was made on a corporate level.

ii. Physical Health

Healthcare workers deal with many physical health risks, but some specifically stem from or are impacted by the use of technologies. For example, one participant mentioned a new retractable needle that was recently introduced. Although the retractable technology was seen as an advantage in terms of safety, the needles were not being disposed of properly, creating a potential risk of exposure to blood for the housekeeping staff. The issue was successfully brought to the attention of management and is in the process of being addressed.

In another example, a participant shared that a review of OSHA logs indicated that injuries occur when staff move patients. The participant identified the issue as being one of inadequate staff to operate the lifting devices; "there is only one person for that in entire hospital." Trainings are being held to reduce reliance on that one staff member and ensure that others learn to use the devices.

For nonclinical staff who sit at a computer for their entire shift, the physical health issues being reported include vision issues, migraines, wrist pain, shoulder pain, and strains or injuries to the wrist, finger, and arm.

iii. Safety

Technologies can also create safety issues for healthcare workers. In the behavioral health setting, with the use of tele-sitters, patients may "act out" when they are not getting the attention they need. Staff safety can be put at risk, because employees are then charged with de-escalating the situation.

In addition, some participants noted a shift to in-home care, including visits to patients' homes by nurses and respiratory therapists. While this trend is not directly related to the use of technologies, it brings up important safety issues. Participants mentioned additional safety training for nurses, while the safety protocol for the respiratory therapists was not known.

In regard to health and safety in general, one participant shared the following insight, which echoed others' comments about workers being disciplined for systemic technology issues:

A lot of our health and safety is more geared toward an employer health and safety program. We also work in a field where we blame the worker a lot more instead of fixing the core problem. ...[It's] always geared toward, "What could you have done differently;" "How could you have handled this situation" instead of us trying to fix the

problem, because some of those problems you're just not able to fix.... Our health and safety needs to be fixed I think on how we go forward on this because it is more geared toward we blame the workers a little bit more than trying to protect them.

3. Organizational challenges to addressing problems with technologies

Healthcare workers and local USW unions have been active in voicing concerns and advocating for changes related to these issues. According to participants, they have used strategies that include opening tickets with the IT department, working with the Health and Safety Committee, engaging management (including direct supervisors, department heads, and hospital leadership), submitting information requests, bringing issues up in union contract negotiations, filing grievances, contacting the state to report violations, and engaging in legislative advocacy.

The grievance representative emphasized, "We have not gone too much through the class action pieces; we need the actual work to change." There are many organizational factors, however, that present challenges to effectively resolving the issues at hand. These include challenges related to the lack of worker input to technology implementation; the lack of communication and transparency; corporate consolidation; management turnover; organizational priorities; and inadequate training. Inadequate regulations, implementation, and enforcement of laws by the state also presents a challenge.

Lack of worker input to technology implementation

The lack of worker input to technology improvements was discussed by participants as a core issue contributing to negative impacts of technology implementation on their work. As one individual shared, the company consults outside experts to resolve technology issues, rather than the employees that understand the systems and processes in place. The grievance representative, who is personally involved with tracking each technology error and communicating the issues to management, expanded upon these concerns:

There is no labor input, not from the ones who have to finish the process ... If it's going to touch so many different people, then have at least one person in every stage involved... We have to get it done so quickly. There is no reason why we can't [be involved]. I am scheduled 8 to 5 every day, yet it always comes back to "There's too much to be done," and they are still not hearing my voice in that process. It has always been a little bit of a process, but has been more challenging now over the last 2 years. [Our] voice has really been taken away from the process with the changes, the new technologies that the company wants to start to implement.

In this comment, the grievance representative identifies a best practice – involving someone from every area of the organization that will be involved in a technology system in its development. She also notes a change in labor input over the past two years, and throughout her interview, describes the pandemic as a contributing factor to the organizational changes. For one, the pandemic has affected management's availability due to other urgent priorities, creating difficulties for scheduling meetings. She stated, "[The pandemic has] taken a lot of the focus the past two years, but meetings should not actually stop."

In this department, unit-based teams consisting of labor and management representatives working side-by-side are used to drive improvements to workflow and day-to-day functions. This approach provides a structure to ensure that employees have input to changes that affect their work. The grievance representative also noted an increase in the influence of project managers, and a corresponding decline in the influence of the unit-based teams:

It's challenging to have so many project managers. They shouldn't be the ones coming up with the ideas and the processes and how to do a full implementation -- that's what these unit-based teams are designed for. The more project managers, the less our unit-based teams are going to be in the know and the flow of information down to us is going to stop. It's going to project managers instead; that's not what they're supposed to be there for. If they want to work with unit-based teams, more recently the project managers are being used in lieu of unit-

based teams. They say, “It’s so busy,” and “There’s not availability to get people off the phones or off the floor,” because of the call volume. Project managers typically have never done the work. Typically, they are hired from the outside, from other organizations. They think they know the work but you really don’t know the work until you’ve really done it and seen the day-to-day of it.

We’ve always had project managers. I’ve worked with them before, and I know it can work really well, and be a collaboration. During the last two years, with the pandemic, it’s really taken a toll, and changed the way that the project managers are involved with everything. Because it’s so busy, [the message from management is] we need labor to be all hands on deck. No offline work at all; you’re there for your work and that’s all you can do. That’s why the project managers are taking over. Labor is not allowed to do anything but take the calls or process claims. Definitely in the last 2 years, it’s gotten worse.

These comments highlight how structural changes in the organization have encroached on established channels for worker input and influence. They also indicate how the pressures on healthcare organizations due to the pandemic have further contributed to this change, at the expense of worker input to technology and process improvements.

Lack of communication and transparency

The lack of communication and transparency on the part of healthcare employers is another key organizational challenge. In one example, when the QR code for Covid-19 test results was launched, customer service representatives were receiving calls about it not working, yet were never even informed that it was introduced. The member services phone number is advertised widely, and customers expect this department to be able to answer their questions when they call. Yet “...the folks doing all this work on the back end, they do not do the work to go down the pyramid and get [the front line workers] the information. When they do get the information, 2 to 3 days later, it is too late.”

As this participant noted, the lack of communication from those developing and rolling out the technologies not only leads to frustration for customers and employees; it is also ineffective, as it represents a missed opportunity to optimize the process: “We didn’t know about it,... so we could not tell the project manager to request feedback or testing.” She expands on this point:

...[T]hings don’t just happen on a daily basis. It’s a huge healthcare organization. They plan this out; they know. ... I constantly let management know, if you have something on the books where you know something is going to happen, come to us first. Let us know what your plans are on these future projects, so we get ahead of it, and do the legwork in advance, and are not having conversations after the fact. Have some transparency in where they are trying to go, because in order for us as labor to be successful, we need you to be successful. If they want to reduce some work in a certain area or reduce a department or start to merge it, give us a heads-up. It’s your organization, but give us the opportunity to have some input and feedback.

This comment points to the importance of not only having worker input on problems that arise after a new system is implemented, but also having that input during the planning process.

Participants from another health system also shared about the lack of communication from their employer. In this case, the employer did not inform the union about its plans to introduce robots into a new facility under construction; the union actually found out by looking at the website of the architectural firm. With robots to be introduced in long-term care facilities in this system as well, one participant emphasized the need to understand how the robots will be integrated into the workflow. This comment points to the importance of including worker input not only in technology troubleshooting, but also in design and development.

The grievance representative also highlighted the lack of communication from hospital departments that implement automation solutions and do not provide adequate information to workers in other departments that are

affected by the changes. For example, shorthand codes and phrases for doctors have been introduced to patient chart notes, but the coding team that processes claims is not kept in the loop:

...[W]hen the coding team receives the information, there are all of these things missing. The employees are trying to make heads or tails of the shorthand in the chart – we are not privy to that information, but we know there have been changes. There's no transparency, but the burden falls on us: if we code something incorrectly then the organization has imposed huge fines. If there's a fine, it comes back on us as labor, not the doctor... it always comes down to us as a frontline employee. The doctor can say, "I was following the new process," or "It was supposed to have automatically done this." And sometimes there is punitive or corrective action, \$50,000 fines, especially when it comes to our Medicare members, so we are taking the burden of those changes and these supposedly upgraded technologies when they are supposed to make things work more quickly and efficiently but do not.

This comment again raises the issue of frontline workers being blamed for systematic issues, and shows how lack of communication and transparency can have significant consequences for workers.

Another participant identified a longer-term decrease in employer communication with labor representatives over time. As she described it, when EMR was first introduced in the early 2000s, the employer approached the union about the changes, and a committee was established that met weekly and provided a forum for the employee and labor relations staff to provide regular updates. Employees were provided clear information about how jobs would change and which job roles would be impacted. This insight shows how having a structure in place (the committee) to discuss technology concerns facilitated effective technology implementation in the past. But that communication is no longer occurring:

Now today, we're finding out from our members, and the Local's having to notify the employer, saying, "We just found this out," and the employer's like, "Oh really? We didn't know that," and then a day later they're calling the Local and saying "Oh yeah, you're right." We're always seeming to be behind, and that open conversation about technology changes and automation, they're not so forthright with us anymore, and now it's always like we're a step behind trying to deal with those issues.

These comments highlight how communication problems are not only in the flow of information from the employer to the union, but internally within the health system as well, to the point that employer representatives are unaware of changes within their own organization.

Corporate consolidation

This observation about employers being unaware of changes in their organization aligns with that of another participant in the same system: "...it's this big conglomerate that's spanning across states, and it's just getting bigger and bigger, and a lot of what we're finding is the right hand doesn't even know what the left hand is doing. The information – there's a breakdown in communication for sure on the employer side," which in turn affects the union and the workers. This comment indicates how corporate consolidation can contribute to the communication problems at play.

A nurse from another health system that has also experienced a merger spoke of committees that were instituted when EMR was first deployed, but also indicated that she did not know if any such arrangements were planned as the health system plans to switch to a new EMR. She also shared that decisions about the technology implementation are being made at the corporate level. When the nurse, who is a union leader, approached department and hospital management regarding the concerns about training and vacation time, she was told, "Well we really have nothing to do with this; it's a corporate initiative."

Management turnover

Management turnover was another issue that was identified as an organizational challenge contributing to the issues affecting workers. One union leader reported a “revolving door” with the employee and labor relations staff, which seems to be “changing every month.” This lack of consistency compromises the development of a relationship with the employer, which often sends a new lead every time negotiations are held. The grievance representative, who works in a different health system, also identified this issue. Management personnel, including both frontline managers and directors, are quitting or transferring to other departments at an even higher rate in the past two years. Many are dissatisfied with the lack of patient focus in the organization. The constant change contributes to the perception among workers and union leaders that “we’re always starting again” every time progress has been made.

Organizational priorities

The perceived frustration of management that the health system organization is not sufficiently focused on its members also aligns with participant comments related to the overall focus, priorities, and strategic direction of the healthcare companies as an organizational challenge affecting workers. Numerous participants commented on the detrimental impact of the health care systems’ valuation of affordability and profit above all else, including patient care. Participants perceived a contradiction between the company’s stated value of patient care and quality service and its actual practices. Several participants also commented on leadership’s tendency to simply not consider or value worker input. “I think some of it is just a change in mindset—that it’s their business, they’re gonna do what they want, and ‘We don’t have to answer to anybody.’...They’ve gotten arrogant,” shared one participant. Another stated, “It is not so much that the union can’t do anything; it’s that the company won’t let them. The company is very hard on saying, ‘It’s our company; we will use the system that we want to use; you guys can’t tell us how or when or what to change on it. It’s our company.’”

Inadequate training

An additional organizational challenge is the inadequacy of trainings. More than one participant mentioned that trainings were once done in person, with a formal instructor in a classroom, but are now online. This format decreases the effectiveness of the trainings, increasing stress for employees and leading to confusion. The online trainings lack an appropriate avenue for asking questions about the material and receiving a helpful response. One employee also mentioned limited time to complete training, which undermines employees’ ability to learn. In another case, a participant reported that remote employees simply receive an email with instructions in lieu of training. A customer service representative also reported that the overall quality of job training has decreased because the employer no longer provides tests on subjects like math, reading, and typing that employees must pass.

Also in the customer service area, the grievance representative strongly emphasized the need for training around handling calls from individuals experiencing illness or death of a family member, which so deeply impact worker mental health. In addition, she identified the need for some sort of orientation to brief the employees working at home on the hospital context. In-person hospital employees receive updates that remote employees, such as customer service representatives, may also need—such as changing regulations on visitation due to the pandemic, for example. HIPAA training for nonclinical employees could also be a need, as inferred from the concern of a customer service representative that employees could access other employees’ health records.

The endoscopy technician indicated that there is considerable variation between hospital departments in how they approach technologies and training. He commented:

Fortunately in our department, it’s a very specialized unit; education is a high priority for management. If we get a new device, a new product, then we can perform a lot better. Being specialized requires hundreds of devices you need to be proficient at. There is a need to make sure we have all the vendors and all the technology. We

need to be ready. We have Superusers active, people who are part of the staff to learn additionally to the little things we need to know. It creates a support system for education.

This participant also emphasized practices in the surgical department around technology use, such as having technology vendors on-site while surgical technologies are in use. The practices mentioned that have led to positive experiences in some departments could be applied in other departments and systems. However, the comments also suggest the potential challenge of making improvements when decision-making capacity is so diffused across the system.

Inadequate regulations, implementation, and enforcement

Finally, some challenges identified by participants involve larger systems outside the healthcare company. For example, participants discussed the inadequacy of existing legislation on staffing ratios for healthcare workers in one state. The union has been advocating on this issue for 11 years with the goal of changing how direct care is defined, and expanding the types of settings that are covered. One participant described workers' experiences attempting to address inadequate staffing in the long-term care facilities, where staffing ratios do apply under the existing legislation:

So we have had multiple occasions here in the last few months of where we've called the state, the state has come and investigated, and the state literally has told them that "No, there's no staffing shortage here. You have adequate staffing." ... We literally are down to 1 nurse on each floor and 1 CNA on each floor. And the state is still coming in and saying that we're adequately staffed. I mean we've even told the employer, because they wanna start mandating the nurses now to work the CNA shifts, and I said, "Why would you do that? You already have us working 16 hour days. And then you're gonna have us mandated for the CNA shifts also." And we have some nurses working in between 100 to 120 hours.... And they said, "Well, it may be bad business, but we have adequate staff for the state." So the employer knows that what they're doing is wrong, but they just don't care. And we--I don't know how to fix it. Because it doesn't seem like our state, our state is not willing to do anything. Our federal government is not willing to help them at all.

These comments suggest a failure of implementation and enforcement of the existing legislation, which the employer then uses to justify its practices.

4. Positive impacts of technologies

Although this report largely focuses on the negative impacts of technology implementation for healthcare workers, several participants reported positive applications of technologies in their work settings. One participant described how the switch to EMR improved the workflow for nurses and reduced medication errors as compared to handwritten records. A nurse in a different health system described the benefit of electronic charting for interdepartmental communication about a patient, as all notes from doctors, social workers, and case managers are in one place. (Both nurses also mentioned problems with EMR, which are described below.) Barcode scanning was also mentioned as a very effective tool to reduce medication errors for nurses. In addition, an endoscopy technician described how a new process to test scopes using chemical samples has improved safety for patients by ensuring adequate disinfection. Practices mentioned by participants that have facilitated successful technology implementation are mentioned throughout this report.

DISCUSSION

Limitations

Given that the USW represents more than 50,000 health care workers, the small sample size can be considered a limitation to this project, and the results cannot be generalized to the entire population. Healthcare workers representing numerous job types, employers, and geographic areas that were not included in this small, preliminary study may be able to share additional concerns, needs, and solutions related to their experiences with utilizing technology in the workplace.

Implications

Existing research on the negative impact of health information technologies on healthcare employees' working conditions suggests that such impact "[appears] not to be related to the technology itself, but to the choices and processes involved" during implementation (Kirchoff et al., 2021, p. 2946). Therefore, negative impacts may be minimized through strategies such as including healthcare professionals in the process of incorporating new technologies (Kirchoff et al., 2021).

A user-centered design approach can be critical to success (Hong et al., 2020). The findings of this evaluation align with existing research indicating that within the healthcare setting, technology developers are not consulting the workers who utilize their products during design, implementation, and ongoing use (Hong et al., 2020). Healthcare systems also lack appropriate systems to evaluate, troubleshoot, maintain, and fix technologies on which healthcare workers depend for their daily work. Despite the existence of research-based practices for effective technology implementation, this evaluation confirms that health systems are often not applying these practices, to the great detriment of workers as well as patients.

Moore et al. (2020) concluded that further research on the usability and optimized design of health information technology systems must include a consideration of the context of implementation. This evaluation highlights the extent to which organizational factors may compromise efforts to effectively use and improve technologies within healthcare systems. The processes of technology development, implementation, and maintenance occur within highly complex and constantly changing organizational contexts, and are influenced by organizational structures, information flows, and priorities, as well as current events such as the Covid-19 pandemic. As such, organizations seeking to reduce the negative impacts of technologies on healthcare workers must develop strategies to navigate such organizational challenges in order to promote effective technology implementation practices within particular healthcare settings and systems.

This study also draws attention to the impact of technologies on nonclinical workers, who are often overlooked in healthcare-related research. In addition, it points to the variety of experiences between workers in different job types, departments, facilities, and healthcare systems.

Recommendations

To address the negative impacts of technologies on healthcare workers, possible strategies to consider are as follows:

Worker and User Involvement:

- Disseminate information about user-centered design, an approach that includes end users' input in the entire process of technology design and development. This process can institutionalize structures for worker input to technology development. It can include committees that meet regularly to problem-solve technology issues and unit-based teams, as mentioned by participants in this project.

- To promote transparency and effective communication, map organizational information flows, technology processes, and decision-making chains in each hospital and health system.
- Identify stakeholders with an interest in effectively utilizing technologies, and assess the potential for hospital-wide or system-wide changes. These should include technology vendors, developers, and corporate-level employees and decision-makers, as: “Information technology developers and healthcare organization managers should engage and better understand [frontline staff’s] work in order to develop technological and social systems to support it” (Hong et al., 2021, p. 232).
- Identify and promote strategies for meaningful institutional change to reduce healthcare worker job stress and support mental health. These should include system-wide interventions and commitments.

Training and Support:

- Develop trainings requested by participants in the study and promote quality improvements to internal health system trainings.
- Work to develop adequate support systems for workers experiencing technical issues with new technologies. Several useful practices were mentioned by participants in this study, including deploying Superusers, offering end user support groups, and having representatives of technology vendors on-site to address issues.
- Educate health system leadership on the negative consequences of poorly executed technology implementation, including the impacts to company priorities such as patient care, high quality service, efficiency, and affordability.

Research:

- Conduct research on the specific technologies mentioned by healthcare workers in this study and disseminate information about effective solutions. For example, ceiling lifts were mentioned by two participants, and the lack of “devices to help move patients is the single biggest reason why healthcare workers have one of the highest rates of occupational musculoskeletal injuries in the U.S.” (Rubenfire, 2015). Another participant described the benefits of barcode scanners at her facility, yet research identifies the requirements for effectively implementing this technology, and finds that the majority of hospitals do not meet them (The Leapfrog Group, 2018).
- Conduct research on the specific health issues raised by the interview participants and possible solutions.
- Conduct research into legislation and enforcement mechanisms designed to ensure adequate staffing in different states. Compile strategies from healthcare workers who have advocated for adequate staffing levels and support worker efforts to address systemic staffing inadequacy.
- If resources permit, consider whether additional feedback is needed from workers in the job types, facilities, health systems, and/or districts that were not engaged through this project. Compile strategies from healthcare workers in departments and health systems that have effectively integrated technologies and share them among other departments and health systems.

PROJECT DESIGN

The evaluation utilized a qualitative approach, with a focus group and individual interviews of USW healthcare worker members and union leaders that were conducted in December 2021 and January 2022.

Sampling techniques

A convenience sample of USW health care worker members was used. Participants were solicited via emails to the USW HCWC District Coordinators and other active members. In addition, the USW HCWC International Coordinator and other union leaders conducted individual outreach to secure participants.

Instrumentation

A list of open-ended questions to guide the interviews was developed based on initial input from the USW HCWC International Coordinator and the USW TMC Curricula Developer. An existing survey instrument that captures various dimensions of working conditions, the European Working Conditions Survey, was also reviewed and adapted into some questions. The USW TMC Curricula Developer reviewed the questions and provided input to the document. As the interview format was intended to be informal and conversational, the list of questions was used as a loose guide only.

Data collection procedure

All interviews were conducted via Zoom by the USW TMC Intern, with the USW TMC Curricula Developer also participating in the focus group and one individual interview. The focus group was recorded and transcribed, as was one interview in which more than one individual was expected to participate. The remaining interviews were not recorded and participant responses were documented with notes in real time. To protect participant confidentiality and anonymity, each individual interviewee was assigned an identification number to be stored with their interview notes. Participant names and contact information were stored separately.

Data analysis procedure

For the focus group, themes representing participants' primary concerns were identified, and the transcribed notes were summarized and grouped into themes. The full individual interview notes were placed into a chart whereby themes were written into a column without the use of any specialized software.

Description of sample

The focus group consisted of 7 individuals in union staff or leadership positions, and included those with direct care experience in the roles of behavioral health technician, radiologic technologist, and licensed practical nurse. In addition, 5 interviews with individual union members and leaders were conducted. These included a customer service representative, a grievance representative for the union, an endoscopy technician, a pharmacy technician, and a registered nurse.

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