

TECHNOLOGY ENABLED CARE

tec

CYMRU

Digital Nursing Partnership Study

2022-2023

Executive Summary

There has been an increase in the use of technology in Nursing, partly as a result of the Covid-19 pandemic and as a result of national policy such as [A Healthier Wales, \(2018\)](#) and [The Primary Care Model for Wales, \(2019\)](#). These support the move towards collaborative, multi professional, place based care, closer to or at home for individuals. However, it can be unclear how technology or the use of digital in nursing can support nurses and people they support, particularly where the care provided relies on physical skills such as wound dressings, administration of medication, or care to meet an individual's personal needs.

The digital nursing survey set out to try and understand primary and community nurses views on digital tools within nursing. 249 nurses responded across Wales from different areas of practice to the survey. 25 of the respondents also agreed to take part in a semi structured interview carried out by a researcher from Tec Cymru. These provided a wealth of information regarding nurses views, with similar themes being identified from both.

There was evidence that while nurses could identify digital tools used within nursing, there was no one agreed definition of what digital nursing was. The majority of nurses identified digital nursing as having a positive impact on outcomes for patients, by providing quicker access and enabling people to actively take part in their care, aiding them to self-manage their health and wellbeing. Nurses also identified benefits to themselves in terms of working differently, including as part of a wider multi professional team, sharing of information and enhancing the care they could provide. A summary of the themes from the survey and interviews are provided in Figure 1.

A number of barriers were also identified by nurses. A key theme was access to standardised training and education across Wales in digital tools, increasing nurses awareness of tools appropriate for their area of practice and supporting nurses confidence in their use. Most nurses felt their professional judgement was neither positively or negatively impacted by digital nursing, which could mean they were unsure of the impact it had. It may be though, that increasing access to training and education, enables nurses be feel more confident on how digital tools can support or evidence their professional judgement and decision making.

Figure 1. What is Digital Nursing?

Benefits - patients	Benefits - professionals	Key words associated with Digital Nursing	Barriers
Improved Care Increased Access to information Improved ability to self-manage condition Increase continuity of care Improves outcomes	Enhanced Care Sharing of information is easier Increased opportunity to work as a Multi professional team Reduces Travel Can enable mobile working Support decision making	Improved Access Improved care Sharing Information Improved multi professional working Use of technology - electronic records and on line tools Digital future – transformation and modernisation Empowerment and decision making	Confidence Awareness of technology Understanding of what digital nursing is Awareness of education Investment Availability of technology Infrastructure to support implementation Change fatigue

Equally important to nurses was the infrastructure available to support the use of digital tools, which was seen as important in ensuring successful and consistent implementation of these technologies.

This included accessing support from IT departments, access to equipment, availability of funding, consistency in the types of digital platforms available that could help engage patients in their care and support nurses workloads and the way these integrated with each other. In addition, having an agreed way by which nurses can share new innovations they have tested locally and receive help in rolling these out across Wales would be of benefit to patients, nurses and potentially the wider health system.

Nurses also spoke about digital notes consistently in relation to what digital nursing was. This suggests that nurses recognise the value of digital notes in supporting safe, timely and effective care, sharing of information with colleagues / members of the multi professional team and supporting efficient working practices. Enabling access to digital notes therefore, appears to be a priority for many of the nurses who responded to the survey.

Digital nursing undoubtedly has many benefits both to nurses, patients and the wider multi professional team. However, in the move towards increasing the use of digital tools it is important that nurses continue to provide a range of options for those who are unable to use such technology. Therefore, incorporating an individual's knowledge and ability to use technology into nurses holistic assessments, appears to be of increasing importance as the use of digital tools increase.

Based on the results of the survey and interviews, a series of recommendations have been identified, which if implemented would help embed the use of digital tools within primary and community nursing in Wales.

1. Agree and share with nurses an All Wales definition of digital nursing, so nurses have clarity about what this term means.
2. Increase the accessibility and awareness of standardised training and education opportunities including MSc level, for nurses across Wales. This recognises the impact training has on increasing nurses confidence in the types, availability and use of digital tools, how they can be applied to their area of practice and how they can support nurses professional judgement and decision making.
3. Consider the use of digital champions to support colleagues and teams in the use of digital tools within their area of practice.
4. Review the current infrastructure surrounding digital tools including accessibility, funding, availability of equipment and integration with other systems.
5. Consider the development of an agreed way for locally implemented digital tools which demonstrate positive outcomes for patients, to be shared and implemented across Wales.
6. Consider how the implementation of digital notes is taken forward in a consistent way across Wales for those services who currently use paper based systems.
7. Encourage and promote the need to include an individual's knowledge and ability to use technology into nurses holistic assessments.

Digital Nursing Partnership Study

Conducted in partnership between TEC Cymru and Sian Thomas, Consultant Nurse in Child Health ABUHB and Chiquita Cusens, National Lead Nurse for Primary and Community Care, allied to the Strategic Programme for Primary Care.

About the Authors

Researchers, Bronwen Thomas, Megan Barker, Megan Whistance, Bethan Whistance, Georgia Prober-Roberts and Gemma Johns, Head of Research at TEC Cymru.

Chiquita Cusens, National Lead Nurse for Primary and Community Care and

Sian Thomas Consultant Nurse in Child Health, ABUHB (at the time of the survey)

Professor Alka S Ahuja MBE Consultant Child & Adolescent Psychiatrist & National Clinical Lead, TEC Cymru

Simon Drew National Lead for Clinical Adoption and Business Change, TEC Cymru

Sara Khalil, Programme Lead, TEC Cymru

Contents

1. Introduction.....	5
2. What is Digital Nursing?	6
2.1 Key Themes	7
2.1.1 Access	7
2.1.2 Impact on care provided.....	7
Table 1 - Access	8
2.1.3 Technology	9
Table 2 Impact on Care.....	10
Table 3 Digital & technology.....	11
Table 4 Digital & technology - Types	12
2.1.4 Digital Future	13
3. Digital Confidence in Nurses.....	14
Table 5 – How confident do you feel using digital tools	15
4. Education & Training	16
5. Professional Judgement	17
6. Support Required and Challenges experienced	17
6.1 Funding.....	17
Table 6 Support needed	18
6.2 Equipment	19
6.3 Infrastructure	19
6.4 Time Constraints.....	20
6.5 Change Fatigue and confidence.....	20
7. Discussion.....	21
Figure 1. What is Digital Nursing?.....	21
8. Conclusion	22
9. Recommendations.....	22
10. Appendix 1 Digital Nursing Survey Questions.....	24

1. Introduction

There has been an increase in the use of technology in Nursing, partly as a result of the Covid-19 pandemic, for example use of video conferencing to access appointments with medical, nursing and health care professionals.

However, it can be unclear how technology or the use of digital in nursing can support nurses and people they support, particularly where the care provided relies on physical skills such as wound dressings, administration of medication, or care to meet an individual's personal needs. For nurses working in Primary and Community Settings, the use of technology to support nursing activities appears less common than with other professional groups, such as Allied Health Professionals (AHP).

Digital Nursing can consist of a variety of technology which may be aimed specifically at the individual for examples, tele health, tele care, or Apps e.g., Healthy io. It can also consist of electronic tools which support Nurses in their role, such as electronic patient records, electronic staff rostering systems or e scheduling systems for example.

To try and understand Primary and Community Nurses views on the use of technology in Nursing, TEC Cymru with support from a Consultant Nurse in Child Health and the National Nurse Lead for Primary and Community Care allied to the Strategic Programme for Primary Care, (referred to as Senior Nurses within this document) came together to identify a way to engage with nurses on this area of practice.

Previous work has been carried out on Digital Nursing for example the Royal College of Nursing have a variety of publications focusing on the [future of digital nursing](#), [digital roles](#), and [digital innovations](#). The senior nurses reviewed these and considered that while they explored digital nursing, there was a gap in understanding the perspectives of nurses working in primary & community nursing services and how nurses are supported/enabled to develop the use of digital means to help nurses care for their patients in community & primary care services.

Therefore, TEC Cymru and the Senior Nurses agreed to work together to explore;

- Nurses thoughts on digital nursing.
- The extent it is being used within their day-to-day work.
- What support nurses feel is currently available, and
- What more needs to be done to aid nurses with digital tools.

A survey was developed by TEC Cymru Researchers and the Senior Nurses. The survey was distributed through networks by the Senior Nurses assisting with the study, with the aim of reaching an audience of nurses who primarily work in community and primary care settings. The survey link was further shared with nursing colleagues and wider nursing communities/networks. Survey data was collected over a period of five months between June and October 2022.

Who took part?

District Nursing (32%),
Community Nursing (20%)
General Practice Nursing (18%)
Social Care (0.4%),
Care home/Nursing Homes (2%)
School Nursing (2%).

Around 10% of nurses worked in 'other' areas.

During this phase of data collection, 249 responses were collected by the survey. Within the survey, nurses were able to leave their email address if they were interested in being contacted to further discuss their views. This led to an additional 25 semi-structured interviews taking place.

2. What is Digital Nursing?

Nurse participants defined 'digital nursing' in several different ways. Many nurses spoke about the definition in a positive way, expressing how it should help aid patient care by allowing digital information to be shared more easily and improve the level of care patients receive:

"I see it as using technology to perform our duties more effectively, more efficiently. And really, as an aid to communication"

Learning Disabilities Nurse

"Using IT to enable and support better nursing through communication, information and decision support"

General Practice Nurse.

"For me it is about using digital solutions to enable nursing care, all aspects of nursing care"

Clinical Informatics Lead for Community Nursing & Children's Services.

"The way forward in nursing, everything being accessible in one place to aid in nursing care"

Adult Community Nurse

"Using technology in order to effectively and efficiently complete our work"

Community Children's Nurse

"Digital nursing uses information technology to care for patients, relatives, carers and is a tool that help deliver healthcare really" –

Specialist Practice Nurse, CAVUHB.

Some felt that digital nursing was a classification used to define areas of nursing that are solely digital, suggesting that nurses view digital nursing in several different ways. This could be due to differences in their backgrounds and exposure to digital nursing, or the current information available for digital nursing.

Nurses were able to elaborate on their definition of digital nursing, with many mentioning how it should be in aid of current nursing practice, rather than be the focus of future nursing.

While there were numerous definitions put forward by nurses, interestingly, several nurses could not define digital nursing and suggested they were 'unsure of how to define it' and that some had not heard the term used before or did not understand the context in which 'digital nursing' referred to.

"Unsure really - digital consults/ telemedicine links with observations etc?"

Advanced Nurse Practitioner, General Practice.

"I don't know what it means"
Adult Community Nurse, District Nursing.

"I have not heard the phrase before"
Mental health nurse

This is important to note as it may be that more awareness and promotion is needed within the use of digital nursing, along with more awareness and support for nurses. This is however, a relatively small sample and so a wider range of responses going forward may allow for further conclusions to be drawn across the profession.

2.1 Key Themes

The results from the survey and interviews identified several recurring themes based on how nurses defined digital nursing.

2.1.1 Access

Three key areas were identified in relation to access (Table 1). Digital nursing was seen as providing quicker, easier and improved access to services, which many nurses felt would not be possible, prior to the introduction of digital nursing.

This suggests that technology and digital nursing for many nurses 'needs' to support their everyday work, rather than hindering or adding complications to already existing systems and processes. The importance of digital nursing being easy to use was common throughout the responses.

Nurses felt that having access to everything, all in one place, would be beneficial when considering digital nursing tools. This would prevent any delays in accessing and sharing information, while ensuring that tools were as easy to use as possible.

A benefit noted by many nurses was the fast access that digital nursing and the tools within this could achieve. For many nurses this included developing their own systems within their teams such as advanced spreadsheets. Other nurses, particularly those in a community setting felt that having access to iPads allowed for them to access patient records and information quickly when in the patient's home, as long as WIFI was readily available.

Nurses felt that by being able to use digital tools to share patient information (whether this be multidisciplinary or interdisciplinary), allowed for an increase in access to healthcare which ultimately increases the care for patients and allows for a greater level of multidisciplinary working amongst the profession.

While the use of digital tools within healthcare can increase access for some patients, it is important to note that not all patients may wish to use or have access to digital services or technology. While digital nursing is developing, there is a balance required to ensure people accessing nursing services are not discriminated against because of a lack of access, knowledge, ability or willingness to use technology.

2.1.2 Impact on care provided

Within the survey, nurses were asked whether digital nursing had a positive or negative impact on outcomes for patients, with a score of 0 being no impact and a score of 100 being positive impact. Nurses rated this on average 72, with the most common score being 100, which strongly suggests that nurses felt that outcomes for patients were positively impacted by digital nursing.

Nurses identified digital nursing as something that could improve care, by 'improving patient outcomes', through building 'rapport' and 'enhancing and enabling care', including care already being provided (Table 2). Improving patient outcomes formed part of many definitions within the survey responses, focusing on how technology and digital nursing can aid in how patient care is delivered, thus, making improvements to peoples outcomes. The use of digital nursing methods such as remote and virtual consultations, allowed rapport to be built and sustained with patients, enabling an improved level of care in many cases.

Nurses highlighted how digital nursing tools could ensure that the care process was as streamlined and as quick for individuals as possible. The use of digital tools could allow for people to actively take part in their care, feel involved in decision making and promote independence by aiding them to self-manage their health and wellbeing.

Table 1 - Access

Theme	Sub theme and Examples		
<p>Digital nursing was seen as providing quicker, easier and improved access to services, which many nurses felt would not be possible, prior to the introduction of digital nursing.</p>	<p>Accessible and increasing access to healthcare – patient</p>	<p>Efficient & effective</p>	<p>Access to information - professionals</p>
	<p><i>“Any technology that makes care provision more user friendly/accessible” - Advanced Nurse Practitioner, General Practice.</i></p>	<p><i>“Using technology in order to effectively and efficiently complete our work” - Community Children’s Nurse, Community Nursing.</i></p>	<p><i>“Our iPads allow us access to our emails and Teams wherever we are. We can access Welsh clinical portal so we have access to all manner of results and letters and information about our patients, which is great .. if we’re going out to see someone in their own home,....we can get the information while we’re there, assuming that ... we’ve got Wi-Fi Lead Advanced Nurse Practitioner.</i></p>
	<p><i>“Great for the wider community, additional accessible resources for patients, especially those in employment” - General Practice Nurse.</i></p>	<p><i>“The ability to undertake work more effectively” - Mental Health Registered Nurse, Community Mental Health (adult / children).</i></p>	<p><i>“Using and sharing information via digital service which is timely” - District Nurse.</i></p>
	<p><i>..... digital interactions with service users, using technology to be more accessible to clients” - Health Visiting.</i></p>	<p><i>“Good to have info in one place and able to access clinical workstation” - District Nurse.</i></p>	<p><i>“This is where all patients notes and consultations are recorded on computer instead of completing paper notes and these can be shared more easily for all disciplines involved in a particular patients care” - Community Nurse (adult), District Nursing.</i></p>
	<p><i>“Technology is a lot more convenient now for everyone, we can see patients quicker now through E-consult than face to face” - Advanced Nurse Practitioner.</i></p>	<p><i>“iPads and Apps are so much quicker. In my day-to-day work including all these then my day would be 10 times harder without. It would be a long day” - Advanced Nurse Practitioner.</i></p>	
	<p><i>"So, you can be sitting the house with them, talking, showing them that help is here... they can get out and get working on what they need to do faster” - Lead Advanced nurse Practitioner.</i></p>		

2.1.3 Technology

A large emphasis was placed on technology when defining digital nursing with nurses referring to 'linking of digital platforms', 'digital records' and 'being online'. Being online also formed a part of the nursing day for many in the profession and was also highlighted by nurses when defining digital nursing. From the quotes it is clear that the term 'online' can be used to define the general idea of digital nursing in that more parts of nursing are now delivered or accessible online.

Digital notes in particular were an aspect of digital nursing that was highlighted both during the survey responses and throughout the follow-up interviews with nurses.

Some nurses felt that there is still a high reliance on paper notes and documents within the profession, that can sometimes cause issues, with some nurses clearly

"[Also] we do paper referrals that go internally and then they get logged on WCCIS. So, there's still a high reliance on paper. Obviously, the goal is to be paperless, but it feels like we're such a long way off it"

Lead advanced nurse practitioner.

"Would help to aid decision making, at the moment things are handwritten so there are no digital notes, so there's no bank where we can store this information at the moment for school nursing. Retrospective notes can sometimes lose that essence of what you're trying to capture when you're there"

School Nurse.

identifying how digital notes could aid decision making, improve safeguarding, enable continuity of care and support efficient working practices (Table 2).

This was less evident in responses from nurses working in general practice where digital notes are the 'norm' (Table 3).

Table 2 Impact on Care

Theme	Sub theme and Examples		
Improved Care	Patient outcomes	Enhancing and enabling Care	Enhancing communication
<p>Impact on Care</p>	<p><i>“Where nurses use a digital format to provide patients with information and advice on improving their health and wellbeing” - Health Care Assistant/Support Worker Community Nursing (adult / paediatric).</i></p>	<p><i>We’ve got an asthma hub that the patients use, so they take over their own conditions, so they can do reviews using the app and see their medications. A lot of the time it is people who are working, so they use email whilst they’re in work which is much easier than a phone call or face to face. The apps are brilliant” - Advanced Nurse Practitioner.</i></p>	<p><i>“Integrated support that enhances care not causes more issues” - Senior Staff Nurse, District Nursing.</i></p>
	<p><i>“A process to improve patient care, increase accessibility and empower patients” - Health Visitor/Lecturer, Education.</i></p>	<p><i>“Access to technology that enables both client and staff facing interactions” - Community Children’s Nurse.</i></p>	<p><i>“Nursing remotely - non face to face utilising technology for communication between nurse and patient” - General Practice Nurse.</i></p>
	<p><i>“The other thing that I’ve done recently is asked if we can you put steroid cards on [AccuRx] since we have patients on high dose steroid inhalers for asthma or COPD, so if they go hospital, they’ve only got to show the hospital (on their phone)” - Specialist Practice Nurse.</i></p>	<p><i>“Use of digital platforms/ devices aimed at delivering enhanced and sustainable nursing care” - Specialist Nurse, Community Nursing.</i></p>	<p><i>“Well, all our records are currently paper.....Sharing would be easier because we’ve got some colleagues working over in different office, so notes are going between those offices... I guess records would be much more secure” - Health Visitor.</i></p>
	<p><i>“I think its empowered patients so they can do more googling themselves. A lot of the younger patients are quite happy to Google and get more information online. But your elderly group, they would rather have a printout. You can just access the information a little bit better” - General Practice Nurse.</i></p>		<p><i>“Can input data straight away rather than it being lost in communication, as especially at times when you want to write up notes after a home visit or if a safeguarding issue comes up during a school clinic, we have to wait until we go back to base and put all that information in” - School Nurse.</i></p>
	<p><i>“When everybody has access to the same system the theory is there shouldn’t be any delays in treatments, therapies, referrals” - Community Mental Health Nurse.</i></p>		<p><i>“In this day and age with safeguarding I think it’s the way forward (DN). It comes back to communication every time and if we’ve got it at our fingertips, and everybody can access it, I think it’s much safer than just paper records. You have to make sure they’re stored properly, whereas if it’s digital it’s a bit easier with password and encryptions, it’s better all round.” - Health Visitor.</i></p>

There was a vast variety of different types of technology and systems used by nurses across the different specialities, ranging from Microsoft Office to AccuRx/eConsult. Technologies such as e-consult or AccuRx (Table 4) were seen positively as it allowed for people to be seen without coming into the GP practice, which saved time and travel for patients. It was noted that not all community nurses have access to this system as it is primarily used within General Practices, however this may be an area of technology that could be explored more within other community settings, in the future.

Some nurses also identified the use of the telephone within their role being related to digital nursing, as many had been running telephone clinics since the COVID Pandemic. Others had been using it as a triage service or to communicate with patients' families. Regardless of the systems used though, it was clear though how important to nurses it was that these platforms and systems can be linked together (Table 4).

Table 3 Digital & technology		
Theme	Sub theme and Examples	
	Linked together	Being online
Digital & technology	“Use of IT computers, telephones, text messages, emails” - General Practice Nurse.	“Online nursing programs that support care” - General Practice Nurse.
	“Emails, telephone and video appointments, online referrals and referral updates” - Advanced Nurse Practitioner, General Practice.	“Anything involving online - computer technology to deliver or assist with care” - Practice nurse.
	“Linking in with digital platforms to communicate and share care throughout appropriate nursing contacts” - Specialist Nurse, Care Home.	“Digital working is incorporating Information technology and resources used i.e. iPad, Laptop and digital tools for everyday working - Desktop, Outlook, Calendar, Teams, Emails, Health roster, Malinko, ESR, Training. All used to improve work effectiveness, Time management, Patient safety, effectiveness” - Team Leader, District Nursing.

Table 4 Digital & technology - Types

Theme	Sub theme and examples		
Digital & technology - Types	Video conferencing	Digital notes	Telephone
	<p><i>"E-consult is brilliant as well; we have used a lot of it. That is becoming more popular, we are encouraging patients to use that a lot more now"</i> - Advanced Nurse Practitioner.</p>	<p><i>"All our admission and discharge summary letters are digital"</i> - Paediatric Practice Nurse.</p>	<p><i>"School nurses run a NUS clinic and has been done through telephone during pandemic as we didn't have the equipment available to use to use the digital technology in that way"</i> - School Nurse.</p>
	<p><i>"I had a patient to come in that I was not able to diagnose. She had a rash and said what you think of this, and I said, well, I don't know, but I took a photo and I uploaded it into our e-consult system for the GP to have a look. There was no GP available to have a look while she was there you know, so these tools, I think they so beneficial and you know. it would save an appointment and they would get back to her"</i> - Nurse Manager.</p>	<p><i>"Electronic record keeping with aim to reduce and stop paper notes. The records can be accessed remotely in patient homes that ensure records are timely and accurate. "</i> - Advanced Nurse Practitioner.</p>	<p><i>"I use WhatsApp with all the families through my work phone, and they found that very useful to communicate with the parents"</i> - Paediatric Specialist Nurse.</p>
	<p><i>"I'm using the AccuRx all the time - it's great, so if you do a contraception review you can send an NHS advice - something that you forget in the consultation you can add the information"</i> - GP Nurse.</p>	<p><i>"We're a paperless practice. everything is recorded and it can be logged into from various portals like from we can log in remotely from home which is happened with a lot of practitioners through the pandemic. You know, so that these where there's no face to face with patients, it makes such a difference"</i> - Nurse Manager.</p>	<p><i>"They do like having the asthma reviews over the phone if they're stable, you know people are busy they've got working lives so if they're pretty stable you can do it over the phone"</i> - GP Nurse.</p>
	<p>Digital can also facilitate remote access via links like attend anywhere so people can choose consultation via this system."- Advanced Nurse Practitioner.</p>		

2.1.4 Digital Future

When defining digital nursing, many nurses referred to it being the 'future' of their profession, with digital nursing being seen as positively impacting ways of working with an average score of 71, with a score of 0 being no impact on ways of working and a score of 100 being a positive impact on ways of working. The majority of nurses also felt that digital nursing had a place within the current nursing culture, with an average score of 74, based on the same scoring system as noted above.

"The way forward in nursing, everything being accessible in one place to aid in nursing care" - **Adult Community Nurse.**

Responses included terms such as 'transformation', 'promotion' and 'modernisation'. For many of the nurses, they perceived digital nursing as a huge transformation process within the nursing profession.

"A new era in nursing, A good management tool. Innovative" - **General Practice Nurse.**

"Using technology to modernize nursing and make the services more efficient" - **Adult Community Nurse.**

"Modernised nursing using technology to assist in triaging patients and appropriately signposting or reviewing" - **Advanced Nurse Practitioner, General Practice.**

There was also evidence of how digital services were already modernising and transforming the way nurses worked such as reducing the amount of travel and allowing better utilisation of nurses time and helping nursing move forward assisting nurses by advancing their skills and increasing patient care.

"I'd say positively. You know, it's all it helps us get our job done...and you know informs what we're doing and how we're how we're doing it" - **Community Clinical Lead Nurse.**

"It's easier - you don't have to travel to all these various places, and then there's the parking, you can do it all online - I prefer it it's a lot easier" - **GP Nurse.**

"Particularly as community teams, when we're having meetings, we do various things like pressure ulcer scrutiny panels, which lots of the nurses might get involved with. But rather than them all traveling three or four miles down the road to have a meeting with people, we just jump onto Teams and it's much more time effective because then you're not doing that extra bit of travelling. You just jump onto the meeting and then you can go out and go see your patients straight from base then" - **Advanced Nurse Practitioner.**

Other nurses though spoke about their preference for face to face consultation and communication;

"I much prefer face to face, you can see the patient and pick up on things - nurses use all their senses like you can smell ketones if you've got a diabetic" - **GP Nurse - Advanced Practice Nursing.**

"We still have face to face meetings as well. What I heard a lot from other people is that not meeting face to face is not as good for making those kinds of tactile and interpersonal bonds. It's not as good for camaraderie. So, I think it's just making sure that everyone gets that balance - those certain meetings we want to meet face to face, but other meetings we can do online for efficiency" - **Advanced Nurse Practitioner.**

With the constant changing of systems, one nurse commented how they feel they are now reaching a 'happy medium' in converting daily tasks into digital ones. However, they felt more was needed from Health Boards to support the use of similar systems in order to share information more easily.

“I think we're getting to a nice happy medium now. I think we didn't have much in the way of technology then we moved onto virtual everything, and I think we're coming back to sort of a balance between the two, but yeah, I wish health boards would buy into it. The same systems to be able to share information” - Service Manager.

3. Digital Confidence in Nurses

Within the survey, nurses were asked how confident they were using digital services outside of a professional nursing capacity, with a score of 0 being not very confident and a score of 100 being very confident. The survey gave examples of booking personal appointments online, using social media, online banking and online shopping as types of different digital services.

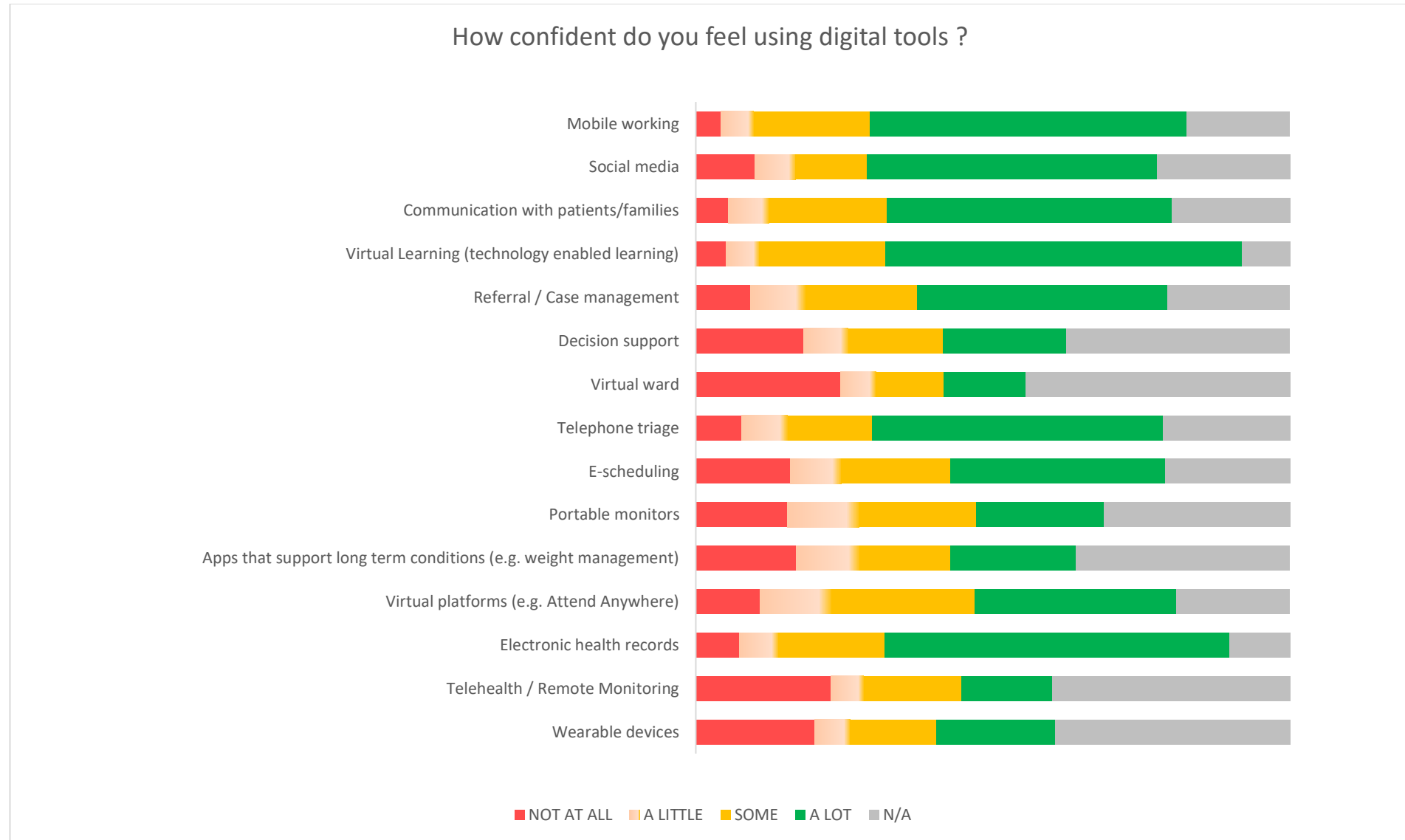
The majority of nurses felt very confident with using digital services outside a professional nursing capacity, with the most common answer being 100 (very confident). Although answers ranged from 2-100, on average the score was 84, suggesting that nurses felt confident rather than not confident at using these digital services. This suggests that nurses answering this survey were more likely to have a higher confidence in using digital within their professional practice. Despite this, it is important to remember that this is just a small sample of nurses who had access to the survey at time of distribution, and therefore it is not generalisable to the nursing population on a whole which would display far more nuanced responses.

Most nurses also felt confident using digital tools professionally with the most common answer being 100 (very confident). Although answers ranged from 0-100, on average the score was 75, suggesting that there were more nurses that were confident with the tools than those who were not.

Nurses were also asked to pick from a list of tools, the ones they used most frequently and how confident or not they were with them (Table 5). The results indicated that nurses used electronic health records, virtual learning, mobile working, telephone triage, communicating with patients/families and referral case management most frequently and as may be expected, nurses indicated a higher level of confidence in using these tools. While e scheduling which is used in District Nursing Services generally rated highly in terms of use and level of confidence, there was also evidence that not everyone was as confident using this tool.

As may be expected, those digital tools used less frequently, rated higher in terms of nurses feeling 'not at all' confident in their use. This can be seen clearly for tools such as telehealth/remote monitoring, virtual ward, decision support and wearable devices 37 – 45 % (Table 5). With a move towards care closer at home, increasing use and confidence in these types of digital tools will be important. It should also be noted though, that many nurses (between 37.5 – 44.5%) felt the tools above were 'not applicable' to their role, suggesting that these types of technology are not generally used within their area of practice.

Table 5 – How confident do you feel using digital tools



4. Education & Training

Nurses thought greater awareness of digital nursing would be helpful in day-to-day work, enabling the utilisation of relevant interventions that could improve care. 90% of respondents when asked if they wanted further training in digital resources replied yes, 3% said no and 7% were unsure. This suggests that any training offered to the nurses may be beneficial and the uptake may be high. However around 77% of nurses completing the survey were unaware of training and support available for digital nursing. This suggests that there is a lack of communication or advertisement for training opportunities for nurses.

Several Nurses spoke about how they would access training if 'made aware of it' and if the training was 'practical'.

"We appear to have very limited digital technology of any description. I would be happy to take advantage of any available training but only if the equipment was going to be available to utilise the skills the training would bring." - **Community Nurse (adult).**

Nurses expressed how they would like the training to be in a face-to-face environment so that they could have hands on training and have the time to learn the skills fully.

"Health board IT courses. Yes, if I can find time to attend. Online training is great as it opens it up to a wider audience, but it can be difficult to grasp the topic remotely." - **Lead Nurse.**

There was a low number of nurses (n = 5) who were aware of specific digital skills courses such as the MSc in Digital Skills for Health Care Professionals, although those who did mention it were currently undertaking it.

"I think that's the way nursing is going. It's really interesting, I've learnt a lot on it. It's definitely interesting. It came up on a global email, so I applied" - **Paediatric Practice Nurse.**

One nurse spoke about how the master's qualification was more advanced than they expected

"I think a lot of clinical staff felt out of their depth and inexperienced when it came to the course... If I was to recommend a course it would be a diploma, PG Cert level" - **Clinical Nurse Specialist.**

The main challenge noted was the impact time and lack of experience had on nurses ability to access training and support.

"Problem is when things go wrong and not experienced enough to fix this. Takes out time to access support to put things right." - **Community Nurse (adult), Acute Clinical Team.**

5. Professional Judgement

Nurses were asked to score whether they thought their [professional judgement](#) was impacted positively (a score of 100) or negatively (a score of 0) when using digital nursing. This was to understand if there was any concern by nurses about how technology influenced the way nurses applied their knowledge, skills and experience to make decisions. On average nurses scored 67, although there were a wide variety of responses with the scores ranging from 0 to 100. The most common score was 50 suggesting that most nurses felt their professional judgement was neither positively or negatively impacted by digital nursing, which could be mean they were unsure of the impact it had. Some nurses were able to give examples of how digital tools could support their decision making, although examples were more common from those nurses working in primary care. This may suggest that nurses working more frequently with digital tools understand how they can support nurses professional judgement.

“...Allow a transfer of photographs to aid in consultation” - Advanced Nurse Practitioner, General Practice.

“...support better nursing through communication, information and decision support” - General Practice Nurse

6. Support Required and Challenges experienced

Nurses were asked what they felt was needed to better support the implementation of digital nursing. Themes identified centred on additional funding, awareness and training, along with better access, infrastructure and integration of platforms. Examples of these are given in **Table 6**. Nurses also identified challenges to implementing digital nursing, some of which were the same as those needed to better support digital nursing e.g., funding, equipment and infrastructure. Nurses also highlighted additional challenges which focused on time constraints, change fatigue and lack of confidence.

6.1 Funding

Many nurses felt the introduction of digital nursing required funding to support and ensure it was sustainable going forward. A number of nurses were personally motivated to use digital nursing tools, but unfortunately did not have the funding or resources required within their roles and teams to be able to test out different technologies;

“There's lots of things I'd love to do but we have not got the funding or resources so we cannot get very far” - School nurse.

“Money comes down to letting your staff go off to do training as well, so they're more informed on future practice. There's loads of brilliant things out there that I'm sure haven't got to us because of the funding to do it” - Advanced Nurse Practitioner.

Table 6 Support needed

Funding	<i>"Money to purchase equipment" - Advanced Nurse Practitioner, General Practice.</i>	<i>"Funding and agreement from Middle Managers" - Team Leader, Community Nursing.</i>	<i>"1. Increased funding & research opportunities towards digital nursing innovations. 2. improved transparency of costing digital innovations as part of Value-Based health and care" - Specialist Nurse, Community Nursing.</i>
Awareness	<i>"Raising awareness of the potential benefits. Patient education and flexibility for those that cannot use these systems or do not have access to them. Education for nurses so that feel more confident using the technology" - Advanced Nurse Practitioner, General Practice.</i>	<i>"Greater visibility of it in use" - Specialist Nurse.</i>	<i>"Awareness of what is available & easy access to this" - Adult Community Nurse, District Nursing.</i>
Training	<i>"I don't think there has been training for Teams offered. Just sort of fumbled along and hoped for the best" - Paediatric Specialist nurse.</i>	<i>"Better systems with all information in one place as currently are half on computer, half on paper and GP information is separate" - Health Visitor.</i>	<i>"Technology wasn't part of our training, so it is very much about that change element, how we go about bringing ourselves into the 21st century and also what has been involved in our training and working with something new. It is all about adapting to that change" - Practice Nurse.</i>
Better access	<i>"Making it easier to access certain facilities. Better working iPads and transferring all paper copies of patients notes to electronic - on the community this would give you a better insight into the patients before visiting, making you better prepared before going in" - Adult Community Nurse, District Nursing.</i>	<i>"Having a service in remote areas" - Health Care Assistant / Support Worker, District Nursing.</i>	<i>"Access to appropriate IT hardware to support the software" - Mental Health Registered Nurse.</i>
Infrastructure	<i>"Better infrastructure within the health board, better equipment. We don't even use Smart phones for work" - Health Visitor.</i>	<i>"A system that is fit for purpose, where all aspects of care given can be recorded and accessed in a timely and contemporaneous manner" - District Nurse Team Leader.</i>	<i>"Systems that are easy to use efficient & avoid repetition, resources - financial, equipment, etc. Robust support system for issues with IT systems" - Specialist Nurse.</i>
Integration of platforms	<i>"Integrated IT between community and hospital services IT / data sharing policies that can facilitate patient care with a wider range of community partners" - Specialist Nurse.</i>		<i>"All Wales digital services so that all using same systems" - District Nurse Team Lead.</i>

6.2 Equipment

In addition, many nurses commented on the lack of equipment that was available to them, with many discussing the inability to access up to date digital resources. Some nurses also expressed frustration in the current quality of equipment which they felt let them down ...

"I think the negative aspects that take away from the positive are having devices that work, having correct Wi-Fi, having the training and competency to use them. There shouldn't be glitches, it's frustrating and puts people off using them" - **Clinical Nurse.**

"We don't have an awful lot of resources digital resources anyway. We've got the computer that we share" - **Health Visitor.**

6.3 Infrastructure

Many nurses commented on the lack of infrastructure to support digital nursing (Table 6). This was highlighted through reference to the use of digital notes as a large part of digital nursing and the integration of platforms, which nurses felt would help simplify systems, make them easier to use and promote the sharing of information between nurses and the wider multi professional team.

Community Nurses, tend to visit people within their own homes, as well as seeing patients in other settings. To support safe practice, access to up to date information regarding the patient is needed. This means any technology used outside the office must be supported, as it would be when used with NHS buildings.

"It's not always possible to access the systems wherever you go. So, if I go to somebody's house if they don't have Wi-Fi, for example, I'm probably not going to be able to connect to the system, so I'm able to revert to paper to gather the information and then transpose it back into digital system when I get back home... Infrastructure is not great. We don't have mobile signal everywhere, especially in West Wales" - **Learning Disabilities Nurse.**

"Less so in general medicine, but in mental health, all of our patient record is digital. So, if we can't get on to that system, we have no access" - **Service Manager.**

"I think we're getting to a nice happy medium now. I think we didn't have much in the way of technology then we moved onto virtual everything, and I think we're coming back to sort of a balance between the two, but yeah, I wish health boards would buy into it. The same systems to be able to share information" - **Service Manager.**

Nurses also referred to the need to improve IT support surrounding digital nursing, noting that current ways to access support such as telephoning IT or logging an action point was too time consuming and did not always result in a reply to problems quickly.

"Only support is to just phone IT with a problem which takes so long to get through or use action point for certain systems which can take a week to receive a reply" - **District Nurse.**

"I have direct contact with the IT guys and haven't got to go through the system so it makes it much easier. That would benefit most teams" - **Paediatric Nurse Specialist.**

In addition, some nurses expressed concern that IT departments could not keep up with the demand for introducing new training, while trying to ensure all systems were running appropriately (Table 6).

“There was very little support from IT services. And I've now gone and shared [my spreadsheet] with other teams. I think the support out there for developing these kinds of systems for teams to work, it's lacking. I think the IT departments are just up to their neck in just trying to keep the existing systems running” - Lead advanced nurse practitioner.

6.4 Time Constraints

Nurses also felt that they were constrained by time, both in terms of having adequate time to pursue training for digital tools or set aside time to seek out support such as IT support.

“There's no time (for training), we are just so horrendously busy - we're far busier than we've ever been before” - General Practice Nurse.

“Times always an issue, but if it's worth doing then you've got to try and get round it, haven't you?” - District Nurse.

A small number of nurses highlighted that they sometimes used their own personal time to complete further training.

6.5 Change Fatigue and confidence

Change fatigue and confidence in using digital tools was felt to be an ongoing issue within digital technology as advancements with tools, platforms and software can happen frequently. This was felt to be an issue for those who do not use technology very much in their own personal lives, as it may hinder the nurses ability to learn how to use the tool, nurses perhaps being reluctant to try aspects of digital nursing or shying away from new technologies introduced.

“At the end of the day digital nursing would make their jobs easier. But again, it is getting over those barriers, those who are not born of a certain age and wasn't brought up with technology I think they would struggle more unless they were provided with the right support” - School Nurse.

“There are many people like me who are [age], who aren't necessarily dinosaurs but have a limited confidence” - Community Mental Health Nurse

“I think digital nursing would be picked up quite well, so we've got a lot of new staff and a lot of them are quite young, so I think that they would pick it up really quickly. I think some of the older staff would find it a bit daunting. I know in they do a lot of stuff digitally - their observations and in departments - but we're all still on paper - feel we're still a bit behind” - Specialist nurse.

“Telephone consultations, text messaging, and sending links. They are a little bit difficult to use, I think it is the confidence to think of some things more when you're doing something digitally” - Practice Nurse.

One solution suggested which may help nurses experiencing change fatigue and / or a lack of confidence, was the introduction of;

Digital champions to support staff who are struggling” - District Nurse.

7. Discussion

The digital nursing survey set out to try and understand primary and community nurses views on digital tools within nursing. The survey and interviews provided a wealth of information regarding nurses views, with similar themes being identified from both.

There was evidence that while nurses could identify digital tools used within nursing, there was no one agreed definition of what digital nursing was. The survey identified key words that nurses used to describe digital nursing and the benefits and impact the use of digital tools could have for patients, themselves and the wider multi professional team, (Fig 1).

Figure 1. What is Digital Nursing?

Benefits - patients	Benefits - professionals	Key words associated with Digital Nursing	Barriers
<ul style="list-style-type: none"> Improved Care Increased Access to information Improved ability to self-manage condition Increase continuity of care Improves outcomes 	<ul style="list-style-type: none"> Enhanced Care Sharing of information is easier Increased opportunity to work as a Multi professional team Reduces Travel Can enable mobile working Support decision making 	<ul style="list-style-type: none"> Improved Access Improved care Sharing Information Improved multi professional working Use of technology - electronic records and on line tools Digital future – transformation and modernisation Empowerment and decision making 	<ul style="list-style-type: none"> Confidence Awareness of technology Understanding of what digital nursing is Awareness of education Investment Availability of technology Infrastructure to support implementation Change fatigue

Nurses also described a range of barriers (Fig. 1), which could impact on the ability for nurses to use digital tools. A key barrier appears to be access to education and training to support the implementation and use of digital tools. Access to education and training can increase nurses awareness and confidence in using digital tools, increasing the likelihood of nurses using these within their area of practice. Ensuring there are a number of nurses or ‘champions’ trained within an area of practice who could support their colleagues, would enable skills and knowledge to be more easily disseminated throughout teams.

However, access to the same training across health boards would be key to ensuring consistent skills and use within areas of practice and across Wales, as would ensuring time is prioritised to support nurses to attend training.

Currently when teams test out digital tools, there can be subsequent delays in accessing funding to continue their use. There can also be difficulties in implementing tools which have demonstrated benefit, within all relevant areas of practice across Wales, as there is no clear process for this. An example of this is Healthy io, a wound management app which has been tested in one Health Board and which appears to have helped improve outcomes for patients with wounds on the district nursing caseload. A consistent way to identify, fund, test and then share learning with agreement on how to take an all Wales approach to implement, would help prevent possible inequalities in outcomes for patients.

Many nurses commented on the infrastructure available to support the use of digital tools. This included accessing support from IT departments, access to equipment, availability of funding, consistency in the types of digital platforms available that could help engage patients in their care and support nurses workloads and the way these integrated with each other. There was also a link to education in terms of nurses understanding which technologies were available or could be, for use within their areas of practice. For example, e-consult

or AccuRx is commonly used in general practice, but could also be of benefit to some specialist nursing services. Therefore, ensuring there is a robust infrastructure which includes the promotion of digital tools available to nurses within Health Boards, is key to ensuring successful and consistent implementation of these technologies in nursing.

Nurses also spoke about digital notes consistently in relation to what digital nursing was, more so than any other type of technology. In some areas such as general practice, the use of digital notes is embedded, however in other areas such as district nursing, specialist nursing and some children/health visiting services, it is less common. This focus suggests that nurses recognise the value of digital notes in supporting safe, timely and effective care, sharing of information with colleagues / members of the multi professional team and supporting efficient working practices. Therefore, enabling access to digital notes which support nurses practice and safe care for patients, appears to be a priority for many of the nurses who responded to this survey.

The majority of nurses identified digital nursing as having a positive impact on outcomes for patients, by enhancing care, providing quicker access and enabling people to actively take part in their care, aiding them to self-manage their health and wellbeing. Interestingly though, most nurses felt their professional judgement was neither positively or negatively impacted by digital nursing, which could be mean they were unsure of the impact it had. It may be though that increasing access to training and education, enables nurses be feel more confident on how digital tools can support or evidence their professional judgement and decision making.

Digital nursing undoubtedly has many benefits both to nurses, patients and the wider multi professional team. However, in the move towards increasing the use of digital tools particularly ones which enable access to nurses or support self-management, it is important that nurses continue to provide a range of options for those who are unable to use such technology. Therefore, incorporating an individual's knowledge and ability to use technology into nurses holistic assessments, appears to be of increasing importance as the use of digital tools increase.

8. Conclusion

Digital nursing is not a new concept, but the survey and interviews have identified areas of development required in Wales, to embed the use of digital tools within primary and community nursing. Many nurses understand the value of digital tools within nursing and are clear about their benefits to patients, nurses and the wider multi professional team. However, successful implementation of digital tools within nursing is reliant on a clear infrastructure, increased awareness and training in their use. Achieving this, will increase nurses confidence in the use of these tools and how they can be applied to their area of practice, enabling nurses to do what they do best – providing safe, holistic and effective care.

9. Recommendations

1. Agree and share with nurses an All Wales definition of digital nursing, so nurses have clarity about what this term means.
2. Increase the accessibility and awareness of standardised training and education opportunities including MSc level, for nurses across Wales. This recognises the impact training has on increasing nurses confidence in the types, availability and use of digital tools, how they can be applied to their area of practice and how they can support nurses professional judgement and decision making.
3. Consider the use of digital champions to support colleagues and teams in the use of digital tools within their area of practice.
4. Review the current infrastructure surrounding digital tools including accessibility, funding, availability of equipment and integration with other systems.
5. Consider the development of an agreed way for locally implemented digital tools which demonstrate positive outcomes for patients to be shared and implemented across Wales.

6. Consider how the implementation of digital notes is taken forward in a consistent way across Wales, for those services who currently use paper based systems.
7. Encourage and promote the need to include an individual's knowledge and ability to use technology into nurses holistic assessments.

10. Appendix 1 Digital Nursing Survey Questions

Q1 How would you define 'digital nursing'?

Q2 What area of nursing do you most commonly work in?

Q3 What is your job role?

Q4 How confident are you in using digital services outside of a professional nursing capacity? (Booking personal appointments online, using social media, online banking and online shopping)

Q5 What sort of digital tools do you use professionally? (Please tick all that apply)

Q6 How confident do you feel using digital tools within your professional role?

Q7 How confident do you feel using these digital tools?

Q8 Would you be open to training in these digital tools?

Q9 Do you think your professional judgement is impacted positively or negatively when using digital nursing? (Tension between technology and applying your skills/experience as a nurse)

Q10 How do you think digital nursing impacts ways of working?

Q11 How does digital nursing fit in with the current culture?

Q12 Do you think digital nursing has a positive impact on outcomes for patients?

Q13 Are you aware of support and training available for digital nursing?

Q14 What training and support is available and would you access it? (E.g., NHS Digital Academy, Health Board IT course, MSc Digital Skills for health and care professionals)

Q15 What is needed to better support digital nursing?