Clinician experiences of a hybrid virtual medical service supporting rural and remote hospitals: a qualitative study

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The known: Virtual care can alleviate rural workforce shortages and increase medical access in rural areas but can bring challenges as well as benefits for clinicians.

The new: The Virtual Rural Generalist Service, a hybrid virtual medical model supporting small Australian rural hospitals, is experienced positively by clinicians. It delivers good quality care for patients, job satisfaction for providers and support for local clinicians. The in-person component of the model is key to its effectiveness and acceptability.

The implications: The Virtual Rural Generalist Service model effectively fills medical service gaps and makes rural medical and nursing positions more attractive and sustainable. It is an acceptable and transferrable solution for rural health workforce challenges.

Abstract

Objectives: To explore the experiences of clinicians delivering, facilitating, and potentially affected by a hybrid virtual medical model servicing rural and remote hospitals in western New South Wales.

Design, setting, participants: Qualitative study using semi-structured focus groups and individual interviews, conducted between 7 April 2022 and 16 March 2023, with rural generalist doctors delivering the Virtual Rural Generalist Service (VRGS) within the Western NSW Local Health District, local site staff, and local general practitioner visiting medical officers (GP VMOs).

Main outcome measures: Key themes in clinician experience of the model and recommendations for improved experience, based on qualitative content analysis.

Results: We interviewed 12 VRGS doctors, 25 site nursing staff and nine GP VMOs. Clinicians were overwhelmingly positive about the VRGS, seeing it as providing good quality care and being an innovative and translatable solution to rural workforce challenges. In-person site visits by VRGS doctors were highly valued, especially by local site staff, for team building, skill building and increasing VRGS doctors' understanding of the local context. The VRGS model relies on nursing availability and skill, and creates additional workload for nurses. Nurses in isolated sites valued the clinical support provided by the VRGS. Overall, most GP VMOs valued the fatigue relief offered by the VRGS; however, some viewed the VRGS as diminishing local doctors' autonomy and the viability of their positions.

Conclusions: The hybrid VRGS model is widely accepted by clinicians as providing good quality care for patients and high job satisfaction for providers. The service supports the local health workforce and makes rural medical positions more attractive and sustainable. The in-person shift requirement is central to the model's effectiveness and acceptability. Further investment is needed to train and resource local nurses who play an integral role in providing virtual medical care.

At no time has it been more important to consider the impact that delivering health care has on providers than in the post-coronavirus disease 2019 (COVID-19) period, when an already stretched workforce has been further depleted, resulting in serious workforce shortages across health professions. This has been particularly challenging in rural and remote areas, where it is harder to attract skilled and experienced clinicians.[1,2] The historically inequitable access to health care and poorer health outcomes for people in rural areas[3] are exacerbated by the workforce crisis.

The Virtual Rural Generalist Service (VRGS), launched in February 2020, was developed in response to chronic medical workforce shortages in rural western New South Wales.[4,5] The VRGS is a hybrid virtual medical model that supports small rural hospitals when a local doctor is not available or requires relief. Most VRGS care is delivered via video consultation, facilitated by local nursing staff. Each VRGS doctor is also required to work 25% of their shifts in-person within sites in the district.

Evidence regarding the clinician experience of virtual health care is mixed. Virtual models servicing rural areas can upskill local clinicians, increase confidence in the safety and quality of care provided, and provide high job satisfaction.[6,7] Conversely, there is evidence that rural clinicians are less receptive to telemedicine than their urban counterparts,[8,9] and virtual care can be seen by rural health care providers as a threat to their professional autonomy and livelihood.[10] Virtual consultations require clinicians to develop new skills and can affect the interpersonal dynamics between doctor, patient and nurse.[11] Local staff play a critical role in the uptake and implementation of virtual medical care,[7] especially nurses;[11,12] however, virtual care can create extra workload for these staff, necessitating role re-evaluation and re-definition.[13]

As part of a comprehensive evaluation of the VRGS, which included the experiences of patients and carers,[14] health outcomes[15] and an economic analysis,[16] we sought to understand the experiences of clinicians involved in this novel virtual hybrid model of care: the doctors delivering the service, the on-site nurses facilitating the service, and local general practitioners who work in the rural hospitals supported by the VRGS.

Methods

We used a qualitative approach to explore clinicians' experiences of the VRGS. We report this study in accordance with the Standards for Reporting Qualitative Research.[17]

Study setting

Our study was conducted within the Western NSW Local Health District — a large rural health district with 38 inpatient facilities,

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1 Cohorts of clinicians who participated in the VRGS evaluation, and interview formats and modalities

Cohort	Number of participants	Sex		Number of transcripts	Number of sites represented (of 31 sites)	Number of interviews, by format		Number of interviews, by modality	
		Male	Female			Individual	Group	In-person	Online or phone
VRGS doctors*	12	9	3	12	NA	12	0	8	4
Site staff*†	25	5	20	16	19	13	3	1§	24
General practitioner visiting medical officers	9	4	5	9	7‡	9	0	0	9
Total	46			37	20	34	3	9	37

NA = not applicable; VRGS = Virtual Rural Generalist Service. * Data saturation reached. † The 25 site staff included seven nursing staff, six nurse managers and 12 health service managers. ‡ This does not include two locums who work across multiple sites. § One site staff member requested to be interviewed in person during a site visit by the researcher for the patient experience component of the evaluation. ◆

31 of which are small hospitals that are medically supported by the VRGS when required.

Participants

Three staff cohorts were invited to participate in an interview or focus group:

- doctors who provide medical care via the VRGS;
- nursing staff at facilities serviced by the VRGS ("site staff"), including health service managers and nurse managers who are registered nurses and often fill clinical shifts in these small sites; and
- general practitioner visiting medical officers (GP VMOs) (ie, general practitioners who work both in the local community and at the hospital).

Data collection

All staff members in each cohort were sent an email invitation to participate by a researcher not employed by the health service. Participation was voluntary. In the case of site staff, the invitation was issued via health service managers, who were asked to support staff to participate during work time. Other cohort members were emailed directly. Site staff and GP VMOs had the option of participating by phone or online. VRGS doctors had the additional option of being interviewed in person during a training workshop.

Semi-structured interviews and focus groups of up to five participants were conducted between 7 April 2022 and 16 March 2023 by two independent researchers from the University of Sydney experienced in qualitative evaluation (one of us [AT] and a consultant) using semi-structured interview guides (Supporting Information). Focus groups were limited to staff members in the same type of role (eg, health service manager) to minimise any coercive effects. Individual interviews were offered in addition to focus groups for expediency given the challenge of aligning availability of busy nurses in small rural sites during a period of workforce shortages. Written and/or verbal consent was obtained from each participant. Recruitment for each cohort ceased once data saturation was achieved (VRGS doctor and site staff cohorts) or the target number of participants was reached (GP VMO cohort). Saturation was deemed to have been reached when no additional insights or issues were being raised during interviews.

Individual interviews and focus groups were digitally audio-recorded, transcribed and de-identified before analysis. All data were stored securely in non-identifiable form.

Data analysis

Transcripts for each cohort were coded manually by one of us (AT) and analysed using a content analysis approach informed by the Consolidated Framework for Implementation Research.[18] We used researcher triangulation to corroborate the analysis by having experienced qualitative researchers (two of us [ES and TS]) check two randomly selected transcripts from each cohort.

Ethics approval

The study received ethics approval from the Greater Western Human Research Ethics Committee (project number 2021/ETH01355).

Results

In total, 46 staff members participated and 37 transcripts were produced (Box 1). All staff who volunteered to participate were interviewed (individually or within a group), with four exceptions: one GP VMO who was unavailable in the timeframe required for the study, one GP VMO who did not know what the VRGS was, and two nursing staff who did not respond despite multiple contact attempts to arrange an interview. The collapsed codes common across all clinician cohorts are shown in Box 2.

VRGS doctors

All the VRGS doctors who were interviewed were positive about the service, but identified some operational changes which could improve it. They considered the VRGS innovative and were proud of it.

> It's an exciting thing to be part of. A lot of it's quite historical, so this feels very new and exciting and modern, and a real change to medical thinking and a paradigm for looking after rural health. (VC03, VRGS doctor)

VRGS doctors expressed high job satisfaction. The role provides them with professional fulfillment and compatibility with their personal circumstances.

2 VRGS evaluation: coding framework derived from total sample of clinicians, with illustrative quotes

Code and subcode	Illustrative quotes
Overall view of the VRGS	
Clinicians are overwhelmingly positive about the VRGS	This is a winner that has to be replicated across NSW Health and other areas fast, because this has been a really brilliant thing. (SS02, GP VMO)
The VRGS is a good innovation, a solution to workforce challenges	[VRGS is] a paradigm for looking after rural health, where there are only going to be growing workforce issues, unfortunately, as time goes on, and we're going to need a solution. I think this looks to me like it could be a really good solution, applied on a scale as big as you like, really. (VC03, VRGS doctor)
VRGS model of care	
The in-person component of the model is highly valued, although it was not fully implemented during the COVID-19 pandemic period	What really helped over the time was when some of the VRGS doctors came out, because they gave us their points of view, because we can see it from their eyes. And they got to know us and trust us. So with the doctors that we'd seen in person, we have a really good rapport with on screen … When [the VRGS doctor] came out he did a respiratory assessment session … if we have more [face-to-face training] by the doctors, that would give us more confidence. (SS28, nurse)
	A VRGS doctor came for 2 weeks which was lovely, and the team loved it and they didn't want him to go … Now he knows where we are and what we go through. They need to do a lot more of that. (MA06, health service manager)
The VRGS model relies on nursing availability and skill	The thing I noticed with VRGS more than anything is you had to have good assessing skills, because they're so reliant on your skills. So they can only doctor as good as you can give the assessment, because they're so trusting into [sic] what you say. (SS28, nurse)
	I'll be really, really honest with you, the VRGS model is not good where you don't have skilled nurses … The more experienced the nurses are, the less impact VRGS has on them. (MA05, health service manager)
The VRGS works better for ED patients than admitted patients	I find VRGS easier in ED than I do on the wards, I think we all do, because you don't need that consistency in ED where you do on the wards … At a ward round, and this can be really frustrating, you might have three different doctors over your week. And then you're explaining everything to them, so the admissions are longer. Everyone has different points of view. The changes are multiple because everyone doctors differently. (SS28, nurse)
Quality of care	
Virtual care from the VRGS is appropriate for most presentations	I think probably 80% of the time it's definitely very suitable. Another 10 or 15% of the time we can get by. It would be better if there was an on-site person but we can manage. And then there's probably 5% that no, it's not appropriate and we have to transfer those patients. (VC01, VRGS doctor)
Patients get good quality care from the VRGS, within the limitations of virtual care	It's definitely a lot safer practice than we had before. (MA03, health service manager)
	With my critical care experience and working in [other regional and metropolitan EDs], I don't see a huge gap in the quality in terms of the outcomes for the patient. (SS21, nurse manager)
	The doctors there (VRGS) have got many other skill sets as a generalist, not least good communication and the art of how to do phone and telehealth consultations. (SS02, GP VMO)
Acceptability to patients (clinicians' perspectives)	
Virtual care from the VRGS is generally acceptable to patients if a doctor is not available on site	The feedback [from patients] is, 'Well we would like a person to touch us and listen to our chest and look down our ears. But if we haven't got that, this is the next best thing.' (MA06, health service manager)
Acceptability of virtual care from the VRGS improves with experience	Most patients who haven't dealt with it before, their very first thought is, 'What do you mean the doctor's not here?' or on camera or something like that. And then as soon as the doctor starts things, then it's immediately 'Oh, this is quite reasonable, quite okay. This is quite acceptable as a service.' (SS50, nurse)
Impact on access to care	
The VRGS supports access to health care in rural sites	Now with the support of the VRGS system, I feel we are offering a very supportive, a more clinician-friendly environment, but also offering rural/remote people a very good service in that there is a doctor available 24 hours a day. (MA03, health service manager)
	What do the team think of it? They're very grateful. Without the VRGS, I'm not sure that we would have a rural/remote service. (MA06, health service manager)
The VRGS reduces the need for patients to leave their community for medical care	Less need to transport, less need to retrieve because we are on top of things a lot quicker … And you're not sending people 2 hours down the road with the possibility of hitting a kangaroo or anything and putting them at further risk. (MA03, health service manager)

Continues

It's a great way to be able to deliver rural and regional medicine, practise the type of medicine you want to practise, but also in a way that is compatible with my family.

(VC03, VRGS doctor)

If I had to choose between face to face or this, this is more my long term … because I feel it's providing enough challenge for me, on a personal kind of professional level … you're still seeing [emergency department] patients, but then at the same time it's convenient and the people

2 Continued

Code and subcode	Illustrative quotes
Impact on local workforce	
The VRGS supports the local workforce, providing clinical support for nursing staff and fatigue relief for local general practitioners	Generally overall I think it's a really, really good service and I think it really helps the doctors that are in town here. And plus it helps the nurses, knowing that all those after-hours [shifts], there's always someone. (SS25, nurse)
	It makes me feel better supported as a clinician. (MA03, health service manager)
	At least I got 6 hours sleep … at least when I'm making a decision in the morning I'm not strung out from going back and forth all night. (SS07, GP VMO)
The VRGS makes rural medical positions more viable	It's really such a great service for us out remotely, particularly with the situation in western NSW at the moment with chronic under-resourcing and under-staffing; these places are very stressful places to work. So to be able to hand off the significant load of after-hours consults is a relief and it reduces the burden on us, which I think helps reduce the possibility of burnout, which is very real out in these places. (SS05, GP VMO)
	I don't know if we would have GP or VMO services without [the support of] virtual. (SS22, nurse manager)
Implementation	
The leadership of the VRGS (skilled, respected, well networked) was a key ingredient in successful implementation	I can't emphasise enough the respect we all have for [service leaders] who have headed up the whole thing … They are the key to the success. (VS04, VRGS doctor)

COVID-19 = coronavirus disease 2019; ED = emergency department; GP = general practitioner; GP VMO = general practitioner visiting medical officer; VMO = visiting medical officer; VRGS = Virtual Rural Generalist Service. ◆

> are just amazing. So I mean it's ticking everything. (VC05, VRGS doctor)

Many of the VRGS doctors were living and/or working as clinicians in rural western NSW or had done so previously. They valued being able to support their rural medical colleagues and help provide a sustainable medical service to rural communities. They viewed the in-person requirement of their contracts as important, but most said that they had been unable to fulfill this requirement during the COVID-19 pandemic period due to travel restrictions.

The VRGS doctors unanimously expressed high regard for the VRGS service leaders. Doctors felt like valued partners in the development of the novel service and were highly invested in the service.

> [VRGS leaders] are accessible and they listen and they take on board our concerns, and it's a work in progress, but you never feel like they're just shutting us down, or we're just someone they've employed. We are actually working together as a team to try to work out what is the best model. What can we improve? (VC05, VRGS doctor)

Site staff

Site staff were also overwhelmingly positive about the VRGS. Nurses working at isolated sites were grateful for the clinical support.

> Even just them casting their eyes over through the camera and then just knowing what you're doing is the right thing to do … is beneficial for the [nursing] staff who feel quite isolated, especially at night. (MA11, health service manager)

Health service managers noted that the VRGS model fits at some sites better than at others. VRGS "works beautifully" (MA05, health service manager) when it is used regularly in a scheduled way so that staff "know who to call when" (MA05, health service manager), and where there is a good working relationship between the local GP VMO and VRGS doctors. It was noted that VRGS works less well for sites that have primarily residential aged care patients as the electronic medical record software is unsuited to long term management, and end-of-life care is not seen as the particular interest or expertise of VRGS doctors.

The virtual component of the VRGS model relies on the presence and skill of nursing staff. Nurses want more training for this responsibility and require better resourcing given the increased workload it entails.

> The skill match and the skill upgrade for nurses has not kept pace with the VRGS and the virtual care world. (MA02, health service manager)

> One of the big issues for us has been around the time [virtual care] takes at this end, which isn't factored into the process in any capacity. It is far more time consuming [for nurses] than having an actual doctor here. (MA08, health service manager)

Some health service managers suggested that introducing a new non-clinical virtual support role could relieve nurses of some of the administrative and technical tasks involved in facilitating virtual care.

Site staff were unhappy when VRGS doctors demonstrated a poor understanding of the limitations of their small rural site, and those at rural sites felt that this lack of understanding communicates a lack of care.

> Sometimes some [VRGS] doctors on the other end just do not get how isolated we are, how limited our resourcing is, what we can actually do here. (MA11, health service manager)

> It actually puts a negative impact into the workforce … they're happy to provide a service to us, but they care so

> little about us that they don't even bother to find out what we can and cannot do. (MA02, health service manager)

Site staff saw the in-person component of the VRGS model as highly valuable for expanding VRGS doctors' understanding of the local context, as well as building rapport and providing in-person education for nursing staff. Staff at sites where VRGS doctors had worked in-person shifts said that this had been "really amazing" (MA09, health service manager) and wanted more in-person VRGS shifts.

GP VMOs

The GP VMO cohort was the most heterogenous cohort; their views about the VRGS ranged from highly positive to highly negative.

The majority of GP VMOs interviewed said that the VRGS provides good quality of care most of the time and is necessary to provide medical coverage in the region. Many GP VMOs expressed gratitude for the overnight cover offered by the VRGS and said that this makes working in rural areas more attractive, and several of them said that their positions would be unsustainable without this support.

> I come back here to these remote sites primarily because of VRGS … I'm happy to work long hours because I know I'm generally not going to be disturbed [overnight] for lots of things that you are in other places. (SS02, GP VMO)

> VRGS, for me, was a game-changer. Seriously, if I had to keep doing it 24 hours a day, either I would've had a heart attack, or I would've had a mental burnout and I would've just quit. (SS09, GP VMO)

The minority of GP VMOs who expressed dissatisfaction were unhappy with virtual medical services in general, not only the VRGS. They cited diminishment of local doctors' autonomy, diminishment of service quality due to lower clinical competence and higher workload, and investment in virtual services "eroding the norm of having a doctor on the ground" (SS07, GP VMO).

Discussion

In our study, the majority of clinicians saw the VRGS as a successful innovation that increases access to medical care in rural areas, supports the local health workforce, and provides good quality care for patients, particularly in emergency departments. The model relies on the availability and skill of local nurses to facilitate virtual consultations and requires increased investment in training and resourcing for the nursing workforce. The in-person component of the model was highly valued for familiarisation with the local context, team building, and the training provided to nursing staff by VRGS doctors when they are on site.

Our results indicate that, from a local clinician perspective, the VRGS model of care can improve support for local staff and potentially improve quality of patient care. Although the quantitative impacts of the VRGS on staff retention and attraction have not yet been explored, our findings suggest that the VRGS addresses some of the concerns known to affect attraction and retention of staff,[19] such as lack of support and after-hours relief.

Health care providers' knowledge of local context is particularly important in rural sites with unique historical and demographic characteristics spread across a wide geographical area. As noted by health service managers, each site is different. Local nuances, such as the diagnostic resources available and the distance to the nearest procedural health facility, affect treatment and discharge planning.[7] As well as the in-person component of the VRGS model, the intentional recruitment of doctors familiar with the challenges of rural medicine, and training specific to building local knowledge, has helped increase the acceptability of the VRGS model to site staff. The results of our study are of interest as there is broad acceptance of a genuinely hybrid employment model in the VRGS supporting and maintaining the delivery of face-to-face care by local and visiting medical officers.

The results of our study confirm previous findings that the viability and effectiveness of virtual care relies on in-person staff.[7,11,12] The quality of assessment provided by the VRGS relies on hands-on clinical examination conducted by a local nurse. In a rural context where there is wide variability of skill and experience — with many inexperienced and overseas-trained nurses, high staff turnover, and reliance on agency staff to fill workforce gaps — standardising and maintaining nursing assessment skill levels is a constant challenge requiring ongoing investment. Concurrent with the implementation of the VRGS, the local health district established a specialist team (the Rural Generalist Nurse Education Team [RG NET]) that delivers tailored clinical examination and assessment modules for rural nurses;[5] however, our results suggest that nursing staff feel that more training and support is required.

It is important to patients and carers that a nurse is present during the virtual consultation.[14] However, this is challenging for nurses, who consistently report that the virtual modality adds to their workload — for example, needing to access and operate technology and address technical difficulties when required. This increase in workload is multiplied by the recent profusion of virtual services now being offered to rural sites, such as virtual pharmacy and allied health. Such a significant culture shift requires re-evaluation of workforce configuration, with the potential need to create new non-clinical roles to facilitate the administrative and technical elements of virtual care.[13]

Our results suggest that service developments could improve the clinician experience of the VRGS model. These include:

- ensuring consistent fulfillment of the in-person component of the VRGS model of care (adherence has improved since the period of this study);
- implementing additional training for nursing staff to increase and standardise workforce skill levels, particularly in clinical assessment; and
- relieving workload pressure for nursing staff by considering the impact of virtual care on clinical staff time and creating a non-clinical "virtual support" role at each site to support multiple virtual services.

Our study had some limitations. Firstly, the clinicians who participated in our study may have been biased owing to the self-selection method. Secondly, recruitment of site nursing staff was mediated by health service managers and could have been influenced by them, intentionally or unintentionally. Thirdly, some GP VMOs had difficulty isolating their views about the VRGS from those about other clinical services; for example, some conflated their feedback about the VRGS and vCare (a 24/7

emergency specialist service within the local health district). Finally, we did not sample the views of medical specialists who interact with the VRGS.

In conclusion, rural clinicians see the VRGS as a successful innovation which increases access to medical care in rural areas, supports the local health workforce, and provides good quality care for patients. The model offers a translatable solution to rural workforce challenges by filling medical workforce gaps and making rural clinical positions more attractive and sustainable. The in-person component of the model is central to its acceptability and effectiveness.

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Competing interests: This study included VRGS operations and governance. Shannon Nott was not involved in data collection or analysis for this study.

Data sharing: The data for this study will not be shared, as we do not have permission from the participants or ethics approval to do so. ■

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Supporting Information

Additional Supporting Information is included with the online version of this article.